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Railway Age

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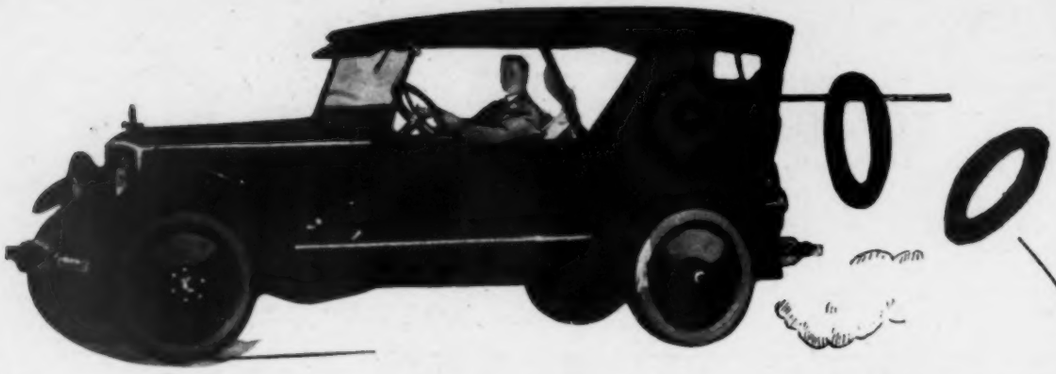

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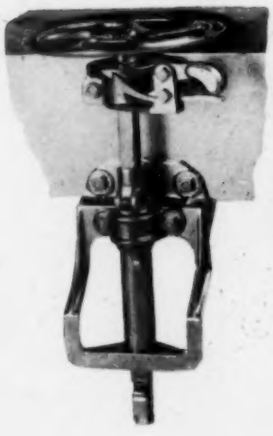

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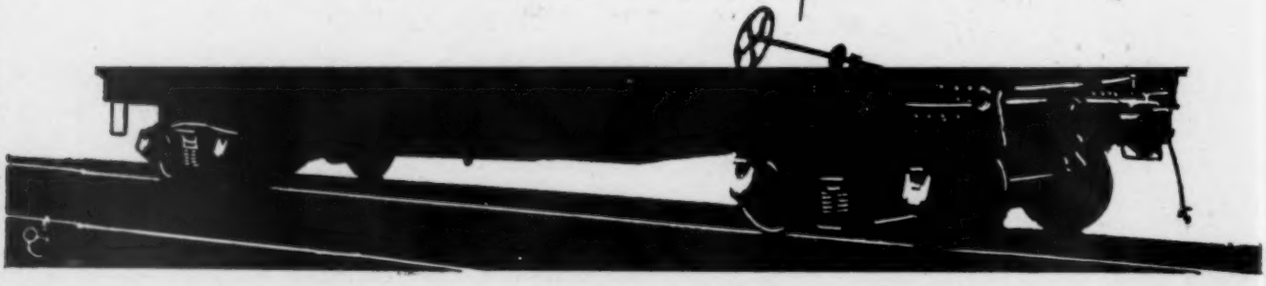

EDITORIAL

Railway Age

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The collision at Linworth, Ohio, reported in another column of this issue, is in many respects like that at Lakeview, N. C., which was the subject of an editorial in the *Railway Age* six weeks ago (August 2), discussing some of the difficulties which a superintendent or trainmaster encounters in securing perfect obedience to the regulations for the safe movement of trains under permissive signals in a manual block system. In the Lakeview case it was assumed that permissive signaling was necessary, in the situation described, and the editorial discussion proceeded on that assumption. The Linworth case is different in that, according to the government investigator's opinion, permissive signalling was, at that time and place, wholly incompatible with safe train operation; and his vigorously worded conclusion, condemning any method of operation except the absolute space interval, merits the serious attention of all operating officers who have to do with conditions like those described. To what extent are operating officers—particularly trainmasters—convinced of the wisdom of this latest deliverance of Mr. Borland? Why should not his conclusion, as copied in our abstract, be printed in letters an inch high and be posted on the walls of all trainmasters' offices? There is need for the cultivation of more definite thinking on this matter. If it were a question which could be brought within the scope of the professional safety engineers' plans it would, doubtless, have been the subject, long since, of innumerable lectures, and perhaps of a motion picture. But is it not fully as important as any of the things that those engineers talk about?

Linworth and Lakeview

One of the interesting and valuable papers presented at the eighteenth annual convention of the International Railway General Foremen's Association held at Chicago last week was a discussion of "Better Terminals Versus More Locomotives" in which the author, L. G. Plant, compared the modern locomotive to a power plant on wheels. Mr. Plant's paper, presented practically in full on another page of this issue, calls attention to many of the high points in the use of locomotives which have been occupying the minds of railroad men to an unusual extent, particularly in recent months. The importance of concentrating on the operation of the most economical units is pointed out as is also the relation between inadequate terminal facilities and a low proportion of locomotive time in service. An effective illustration of this is afforded by reference to the performance of locomotives on the Union Pacific for the current year as compared with four years ago. Following are some brief and significant quotations from the paper: "Dependable power has always been regarded as the most vital requirement by the motive power department. . . . No saving in the cost of operating locomotive shops and terminals will justify engine failures resulting from too rigid economy in their maintenance. . . . Next to reliability in locomotive operation comes efficiency. . . . The same economic law that governs the cost of electric current generated in a stationary power plant also controls the cost of tractive effort at the draw-bar of the locomotive. . . . Locomotive terminal and shop facilities are the determining factors in respect to locomotive utilization and any comprehensive analysis of this problem must take these facilities into account." Accompanying the paper is a series of charts worthy of careful study by railroad men interested in efficient locomotive utilization. A comparison of the results secured on different roads in the same regions may well afford information of value regarding the methods of operation which are producing the best results.

Locomotive Compared to Power Plant

The Signal Section of the American Railway Association at its meeting at Swampscott, Mass., near Boston, on September 24, proposes to do a rare thing in the railroad world; to discuss a really fresh and important subject for a whole day; and there is no doubt that the time will be well filled; and by men who can give real information. The subject is automatic train control. The announcement was printed in the *Railway Age* of September 6, page 429. No operating officer within a thousand miles of Boston can afford to neglect this meeting, for in no other place can he find such a good source of up-to-date information on this subject. The Swampscott gathering will not be simply a meeting of signal engineers. Leading signal engineers will do much of the talking, but they would be exceedingly pleased to have a large number of managers, superintendents and trainmasters with them. The most instructive discussion that has thus far been available on automatic train control was that which was begun before the Interstate Commerce Commission at Washington last May and was concluded in the Commission's order issued two months later (July 18). The forthcoming discussion may be expected to be a thoroughly illuminating and useful review of what was done by the Commission and what is being done by the railroads.

The Signal Section at Swampscott

The railway labor leaders practically nominated LaFollette for president and the leaders of the American Federation of Labor have endorsed him. Their campaign is an attack upon private ownership of railways and the present political and industrial system of the country, the attack being based mainly upon the ground that under this system the working man does not get what is due him. At this time, therefore, especial interest attaches to a study of wages on the railways and in manufacturing industries which has been made by the National Industrial Conference Board, and a summary of which is published elsewhere in this issue. This study shows that in the first quarter of 1924 the purchasing power of the average *weekly* earnings of railway employees was 20 per cent greater than in 1914. The weekly earnings of railway employees had increased this much more than the cost of living in spite of the fact that there had been a reduction of ten hours in the average time worked by them each week. The purchasing power of their average earnings *per hour* is 44 per cent greater than ten years ago. The purchasing power

Has Labor Been Badly Treated?

of the average *weekly* earnings of employees of manufactories increased 32 per cent in this ten years or even more than that of railway employees, but the difference was due to the fact that railway employees received larger reductions in their hours of work than employees of manufactories. Stated merely in money, and disregarding changes in the cost of living, the average hourly earnings of railway employees increased from 25.4 cents an hour in 1914 to 60 cents in 1924, or 136 per cent, and those of employees in manufactories from 26 cents to 59.4 cents, or 128 per cent. In view of this record it is hard to believe that railway employees and other working men will give their support to a political movement the purpose of which is to force the railways into government ownership and revolutionize the political and industrial institutions of the United States. The incomes of working men have increased and their living conditions have improved more within the last ten years than those of any other class of people in this country. Furthermore, corresponding increases in their earnings and improvements in their living conditions were occurring before the World War began. They have everything to lose and nothing to gain by supporting a movement the revolutionary and destructive purpose of which is indicated by the fact that it is receiving the support of the Socialist party.

The "Blacklist" Up to Date

THE DIFFICULTIES encountered in carrying on a political movement which is dominated by one group of persons, but which must rely almost entirely for success upon the votes of an entirely different class of persons, is strikingly illustrated by the LaFollette so-called "Progressive" movement. This movement is finally beginning to be accurately characterized in popular parlance. It is now being called the "Socialist labor movement," which is correct, since it is dominated by railway labor leaders and endorsed by the Socialist party. It is dependent, however, for whatever actual results it may accomplish chiefly upon the votes of farmers in the west and northwest.

Both the blacklists of congressmen which have been published in the official organ of the railway labor leaders, and the fact that Senator LaFollette is actually running upon the platform adopted at the Cleveland convention of the labor leaders, while at the same time distributing as his platform among the western farmers an entirely different document, shows how hard it is to maintain coherence in a movement which is trying to attract the votes both of the farmers, who are the largest property owners of the United States, and of the Socialists, who desire to confiscate all private property, beginning with the railways.

We have shown in editorials heretofore published in this paper how the convention at Cleveland that nominated LaFollette was dominated by railway labor leaders, and especially how the first blacklist of congressmen published in "Labor," the official organ of the railway labor leaders, approved or condemned members of Congress entirely according to how they voted on railway labor legislation and entirely regardless of how they voted on "farm relief" legislation. But the editorial in our issue of August 2 concerning the blacklist published in the issue of "Labor" of July 26 did not, as subsequent developments have shown, do full justice to the subject. We showed in that editorial that the railway labor leaders had caused forty congressmen in certain states to be blacklisted regardless of the fact that seventeen of them had voted for the McNary-Haugen bill, the principal "farm relief" measure introduced at the last session of Congress. We quoted from "Labor" the specific statement that they had been blacklisted entirely because they had voted against the Howell-Barkley bill, the measure to abolish the Railroad Labor Board which was written by the railway labor leaders. Since then, however, "Labor" in several different issues has furnished additional information which ought to be highly interesting to the western farmers that the railway labor leaders are trying to get to vote for LaFollette and government ownership of railways.

The congressmen the labor leaders are supporting for re-election and their records are as significant as the congressmen they are opposing and their records. Now, up to date the labor leaders have blacklisted a total of 94 members of Congress in 21 different states, all of whom voted against the Howell-Barkley bill or failed to give it the support the labor leaders demanded. The record shows that of these men 28 voted for the McNary-Haugen bill. Those blacklisted, in spite of the fact that they voted for the McNary-Haugen bill, are Timberlake of Colorado; Anthony, Sproul, Hoch, Strong, White and Tincher of Kansas; Johnson of Kentucky; Green of Massachusetts; Michener, Ketcham, Cranton and McLaughlin of Michigan; Faust, Roach, Milligan, and Manlove of Missouri; Leavett of Montana; Cable, Brand, Murphy, Cole, Moore and Kearns of Ohio; Reece of Tennessee; Hadley and Johnson of Washington, and Winter of Montana.

The labor leaders also have endorsed 130 members of Congress in 24 states. Of those endorsed every man voted for the Howell-Barkley bill or was paired in favor of it, and 46 of them voted for the McNary-Haugen bill, while 71 of them voted against the latter bill. Therefore, with respect to the McNary-Haugen bill, a measure that was supported by most of the farm organizations of the country, the record to date is that the railway labor leaders have blacklisted 28 congressmen who voted for it, endorsed 71 congressmen who voted against it and endorsed 13 who did not vote on it at all. The labor leaders are running LaFollette for President. In their behalf he is advocating the Howell-Barkley bill and government ownership of railways. They are relying on him to carry some western and northwestern states by the votes of the farmers. They are pretending that their Socialist labor movement is also a farmers' movement. At the same time they are urging the members of their own unions, in voting for candidates for Congress, to stick the knife into a majority of the congressmen who voted for the McNary-Haugen farm bill. If in view of these facts the Socialist Labor party can win the votes of the farmers, we shall admit that the labor leaders are very smart men and that the farmers are as stupid as the railway labor leaders evidently believe they are.

But this is not all. As already indicated, this Socialist labor aggregation has one "platform" for the farmers and another for the railway employees. It is distributing a document entitled "Statement and Platform of Robert M. LaFollette" which says: "We demand that the Interstate Commerce Commission proceed forthwith to reduce by an approximation to pre-war levels the present freight rates on agricultural products, including livestock and upon the materials required upon American farms for agricultural purposes." A careful reading of this document discloses, however, that it is merely one that was presented on behalf of LaFollette to the Socialist labor convention at Cleveland. The convention at Cleveland was dominated by the railway labor leaders. The chairman of the Committee on Resolutions was D. R. Richberg, general counsel of the railway labor organizations. All that the platform presented by Richberg's committee at Cleveland and unanimously adopted by the convention says regarding the railroads is, "Repeal of the Esch-Cummins Act, Public ownership of railroads with democratic operation and adequate safeguards against bureaucratic control." There is not a word in it specifically referring to reductions of freight rates on farm products.

Why does the Socialist labor party, in what it is distributing among the farmers as "LaFollette's Platform," spe-

cifically advocate large reductions in freight rates on farm products, and in the platform actually adopted at Cleveland and which through "Labor" and other labor and Socialist papers is being distributed among railway employees, merely advocate the repeal of the Esch-Cummins Act and adoption of the Plumb plan of government ownership? The reason appears to be obvious. They offer reductions of freight rates as a bait to catch the farmer vote and they say nothing specifically about this in the Cleveland platform because there are many railway employees who are intelligent enough to know that a large reduction in freight rates would necessarily result in reductions of railway wages.

The railway labor leaders and Socialists have been working for years to make the continuance of private ownership of railways in this country impossible and government ownership unavoidable. That has been the real purpose of all the propaganda they have carried on and of their support of or opposition to every piece of railway legislation that has been proposed. They are showing that this is their true and only purpose more plainly at present than they ever did before. If the people of the country, and especially the farmers, cannot see this they are blind indeed.

A Question for Serious Consideration

THE QUESTION of the extent to which railways in the central and northern latitudes are warranted in maintaining more than the minimum maintenance of way forces during the winter has long been a subject of discussion. This year, however, this problem assumes added importance. The unusually heavy traffic which the roads were called on to handle last winter resulted in correspondingly severe deterioration of the track and structures. As a result liberal appropriations were made early last spring to restore and improve the condition of the properties. Following the decline in traffic a short time later these programs were curtailed and it is only within the last two or three weeks that a more liberal attitude has again become evident among railway managements. In the meantime, the best of the working season has gone and a large part of the work still remains to be done. The outlook is also promising for a heavy traffic throughout the winter with its correspondingly heavy wear and tear. In view of the short time remaining before cold weather may be expected and the general practice of most roads of stopping improvement work and making drastic reductions in forces at that time the question may fairly be raised whether the roads may not be warranted in changing this practice in part this year.

Industrial America is now going through a transition, with respect to its labor supply. The railways and other industries have been developed on a large supply of European labor. For the first time in history this supply has been curtailed and as far as unskilled labor is concerned has been practically shut off by the new immigration policy. This will soon drain the reservoir of floating labor from which the railways have been able to secure their requirements of seasonal labor in the past, and will force them, in common with other large employers of this class of labor, to utilize it more nearly throughout the entire year in order to complete their programs.

The trend in this direction is becoming evident in many industries, outstanding among which is the contracting industry in which it is being found possible to carry on more and more construction throughout the winter. A number of railways are also following this trend in laying rail and conducting such other roadway improvement work as lends itself to those conditions during the winter.

In view of the large amount of work which remains to be done this year and the shortness of the period in which to do it, maintenance of way officers and those to whom they report and who are responsible for the economy with which such operations are conducted, can well afford to make a careful survey of those operations which can be done with almost, if not as much economy in the winter, as in other seasons in order to develop a program for the performance of those operations during this season and in this way reduce the amount of work to be done next summer and the number of men required to do it, while at the same time providing employment for and holding in the service men who probably drift into other industries if laid off this winter. While it is recognized that many operations must of necessity be performed during the summer, there are other operations which are performed during this season which can be handled as well during the winter. As an illustration, an officer of one middle western road found to his surprise when checking the painting program of his forces recently that the amount of interior painting that was being done during the summer would keep more than 40 per cent of his force busy with equal efficiency throughout the entire winter and that instead he was building up a large force each spring only to disband it in the fall.

It is recognized that a road is not warranted in maintaining an entirely uniform force throughout the year but it is doubtful if the roads can justify the wide fluctuations which now occur in summer and winter forces on any other basis than that of habit. In view of the large amount of work which remains to be done this year and for which the indications are that funds will be available this winter, this subject now warrants more than the usual consideration.

The Equipment Market

THE PENNSYLVANIA SYSTEM placed orders last week for 10,000 all-steel freight cars. The business was divided equally among four companies. It is the largest order to be placed so far this year with a single exception—orders placed by the New York Central last February and early in March which totaled 18,000 cars. Early in March the Pennsylvania also divided an order for 12,000 car bodies among eight companies. Presumably the 12,000 car bodies represented less in actual money expenditure than the new order for 10,000 complete cars.

DOMESTIC ORDERS

Month	Locomotives	Freight cars	Passenger cars
January	125	6,020	29
February	85	18,365	293
March	283	35,846	237
April	100	11,189	131
May	107	435	101
June	1	387	31
July	83	533	149
August	8	4,751	164
Total 8 months	792	77,526	1,135
1923 8 Months	1,756	69,626	1,428
1922 8 Months	1,055	104,423	1,374

The Pennsylvania placed its order last week rather suddenly. It is understood that time was not even taken to issue formal inquiries. The fact that the order was thus placed would seem to indicate that the prices obtainable were very favorable or, in other words, that the Pennsylvania found the present to be an unusually good time to buy cars. At any rate, the order was placed at a time when the equipment market was otherwise idle. Freight car orders in May, June, July and August combined totaled only 6,106, which was only two-fifths as many cars as were turned out in the single month of July.

The Pennsylvania order will probably total not less than $25,000,000. An order of this size will tend to stabilize gen-

eral business. Many expect that it may prove to be a forerunner of large orders from other railroads.

The *Railway Age* has had much to say of late about the desirability of stability in railway purchases and railway expenditures generally. The placing of the large Pennsylvania order at this time is a practical example of what we and others have had in mind when arguing in favor of greater stability of purchases and criticizing the usual feast and famine character of railway expenditure. The Pennsylvania, in this case, has departed from what is too often the usual procedure of railway management. The System's net income at present is not good. In July, 1924, the Company's net railway operating income was $2,100,000 less, or approximately a quarter, than it was in July, 1923. The criticism has been that the railroads tend to buy at the wrong time, in other words, in a seller's market. We have reason to believe that the Pennsylvania bought this time in a buyer's market. The railroad benefits directly from the saving in price, which will very likely be sufficient to "carry" the cars for several months. The supply field will benefit from getting the business in an off season and according to the amount of other business that follows.

The summer months this year have been poor months in the equipment industry, except as concerns the purchase of passenger train cars. In August, the orders for locomotives totaled only 8; for freight cars, 4,751, and for passenger train cars, 164. For the first eight months' period of 1924 the orders for locomotives have totaled 792, the larger portion of which were ordered in the first quarter of the year. This figure of 792 for the first eight months of 1924 compared with 1,756 in the first eight months of 1923 and with 1,055 in the first eight months of 1922.

INSTALLATIONS

Month	Locomotives	Freight cars	Passenger cars*
January	271	15,589	...
February	214	11,386	...
March	176	9,562	699
April	97	8,718	...
May	153	9,199	...
June	160	10,909	698
July	197	16,583	...

*Reported by three months' periods.

Orders for freight cars for domestic service in the first eight months of 1924 totaled 77,526, of which over 60,000 were ordered in the first three months of the year. The figure for the first eight months of this year exceeded the total for the first eight months of last year, notwithstanding the fact that it does not include the new Pennsylvania order. The freight car orders in the first eight months of 1923 totaled 69,626. In the first eight months of 1922, however, the orders totaled 104,423.

Passenger car orders in the first eight months of 1924 totaled 1,135, which business has been fairly well distributed throughout the eight months' period. In the first eight months of 1923 the orders for passenger train cars totaled 1,428 and in the first eight months of 1922, 1,374.

An interesting light on the situation is to be obtained from the figures of orders on hand which are now issued currently by the Car Service Division. On August 1 there were orders on hand, but not yet delivered, for a total of 51,156 freight cars. Deliveries in July totaled 16,583, which means that at the July rate of production, the orders on hand as of August 1 would carry the builders for about three months or up to November 1. The Pennsylvania order for 10,000 cars extends this period for another half month or month, depending upon the rate at which the builders continue to manufacture.

The number of locomotives on order on August 1 was 401. Deliveries in July totaled 197, which means that the locomotive builders on August 1 had only enough business to keep them busy until about the first of October. Inquiries for cars have been forthcoming in much greater volume than has been the case with locomotives. The St. Louis Southwestern recently issued an inquiry for 1,000 box cars. The Texas & Pacific has recently asked prices on from 750 to 3,000 cars. The Reading is inquiring for 3,000 cars. There is a report that the Santa Fe will soon be in the market for 5,000 cars.

ORDERS ON HAND

	Locomotives	Freight cars	Passenger cars
1923			
April 1	1,974	107,453	1,586
July 1	1,902	96,855	1,450
Oct. 1	1,242	64,601	1,231
1924			
Jan. 1	510	24,379	832
Feb. 1	439	21,696	....
Mar. 1	457	40,030	....
April 1	520	62,340	970
May 1	552	62,289	....
June 1	447	57,266	....
July 1	360	57,735	847
Aug. 1	401	51,156	....

Outside of the Pennsylvania, which has already placed its order, however, the outstanding example among the railroads that have seen that the present is a good time to consider the purchase of equipment is the Illinois Central, which has issued inquiries for no less than 4,000 gondola cars, 2,000 box cars, 200 stock cars and 200 express refrigerator cars, for 215 coaches for electric suburban service, for 70 coaches for steam service and also for 25 Mountain type locomotives. The Baltimore & Ohio deserves mention because it recently placed an order for 80 electric motor cars for its Staten Island electrification.

The number of inquiries at present outstanding indicates a fairly active freight car market for the fall months of the year and possibly continued fair activity with reference to passenger car purchases. The disconcerting feature is the extremely small number of locomotive inquiries that are outstanding. In view of the fact that the locomotive builders on August 1 had on their books orders which will carry them only about to the end of this month, it would appear that this might be a very favorable time to purchase locomotives. It stands to reason that the locomotive builders must want the business and would, therefore, probably be willing to make concessions "to start the ball rolling."

Even as this is being written information is forthcoming that the Texas & Pacific inquiry has already resulted in an order for 2,000 automobile cars and that the Missouri-Pacific has placed orders for 10 Pacific, 25 Mikado and 15 switching locomotives and for 50 express refrigerator cars. Apparently the ball has already been started rolling.

Traffic and Earnings Improving

FROM MARCH TO JUNE inclusive, most of the railways had a poor business. In April, May and June especially both total earnings and total net operating income showed serious declines. The *Railway Age* always has expected that the financial results of railway operation in the second half of this year would be relatively better than they were in the first half. The statistics of earnings and expenses in July, which were made public this week, indicate that this expectation has been well founded. In April total earnings showed a decline of $58,000,000, and net operating income a decline of $21,000,000, as compared with April, 1923. In May the decline in total earnings was almost $70,000,000 and the decline in net operating income $30,000,000. In June the decline in total earnings was almost $86,000,000 and the decline in net $22,000,000. In July the decline in total earnings was less than $55,000,000 and the decline in net less than $11,000,000.

The statistics of car loadings encourage the hope that the net operating income shown for August will be little, if any, less than that of August, 1923. In June, when the largest declines of both total earnings and net operating income were shown, car loadings averaged almost 105,000 a week less than in June, 1924. While in July the financial results secured were relatively better than in June, car loadings continued to show almost as large a decline as in June. Since July there has been a considerable improvement in

car loadings. Not only have they been larger than in June and July, but they have approached more nearly the high record attained in August, 1923. In the four weeks ended August 23 they averaged 72,000 a week less than in the corresponding weeks of 1923. In other words, the difference was about 30,000 cars a week less than the difference between the loadings in June and July and the corresponding months of last year. In August, 1923, car loadings averaged only about 41,400 a week more than in July of that year, while in August, 1924, they averaged 74,000 a week more than in July of this year. In the week ending August 30 car loadings amounted to 1,020,339 cars. This was the first week this year when loadings exceeded the million mark and was only 71,811 cars less than in the corresponding week of 1923.

It will be very interesting to watch future development. In August more than one-half of the difference between last year's and this year's car loadings was due to the difference in coal loadings. In the first eight months of this year the loadings of bituminous coal were 71,000,000 tons less than in the corresponding months of last year, a difference substantially exceeding the total amount that was in storage on January 1. There has been recently a considerable increase in the production of bituminous coal. The production in the week ended August 30 was 8,733,000 tons, which was an increase of about one and a quarter million tons over the production in July; but this was a relatively small output, as is shown by the fact that it was 4,000,000 tons, or one-third, less than the amount produced in the corresponding week of 1923.

In 1923 coal loadings were heavy throughout the spring and summer months and actually reached their peak in the first week in September. On the other hand, because of the small production thus far this year, it seems certain that they will go on increasing for some weeks to come, and that they will be actually larger in the fall and winter months than they were last year. The most marked difference between 1923 and 1924, from a traffic standpoint, appears to be that traffic was constantly increasing in the first two-thirds of last year and then began to slump, while it slumped in the first two-thirds of this year and is now showing a tendency substantially to increase. It seems, therefore, not at all improbable that by the time October is reached the railways will be handling as much, or more, freight business as last year.

The improvement in general conditions, which appears to be occurring, is producing an effect upon railway purchases. In the first four months of 1924 the railways placed orders for 71,420 freight cars, or an average of 17,850 a month. Then came the slump in business, and in May, June and July they placed orders for only 1,355 freight cars, or an average of 448 a month. In August they placed orders for 4,751 freight cars. There were also inquiries for a large number of additional cars, and in our issue for September 6 we reported orders that had been placed 11,100 freight cars and inquiries for 2,052 more. Recent inquiries for rails aggregate more than 500,000 tons. The indications are that the railways are at least turning the corner, and that both they and those who depend upon them for a market may reasonably expect to have better business in future months, unless something very unexpected occurs.

New Books

Proceedings of the American Railway Engineering Association. 1382 pages, illustrated. 6 in. by 9 in. Bound in Cloth. Published by the Association, 431 South Dearborn Street, Chicago.

This volume contains the proceedings of the twenty-fifth annual convention of the American Railway Engineering Association which was held at the Congress hotel, Chicago, March 11 to 13, 1924. The proceedings this year correspond very closely in size and contents to those of recent preceding years. Of the total contents, 1,150 pages are devoted to reports of standing and special committees and 156 pages to a condensed stenographic report of the discussion of the committee reports on the floor of the convention. With a diversity of committee assignments, the subject matter of these annual proceedings is necessarily of a decidedly diversified character, covering subjects which range, in this year's proceedings, from a progress report on an investigation of the destruction of piling by marine borers, to specifications for railway turntables. The matter also ranges from the concrete to the abstract as may be illustrated by citing the report of the Committee on Track which includes a large number of plans for switches and crossings, and the report of the Committee on Records and Accounts covering 166 pages devoted largely to an outline and discussion of the proposed revision of classification of accounts by the Interstate Commerce Commission. The volume contains such a vast fund of information that it is very difficult to single out any one of the reports as meriting particular mention. Under this head, however, reference is made to the studies of the requirements of various features of large passenger stations reported by the Committee on Yards and Terminals and the report of the Committee on Economics of Railway Operation which presents analytical studies of certain phases of this subject which afford some measure of the opportunity for such development in this field.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

The Funeral Train, by Harold A. L. DeAryan. Memoir of the Harding funeral train, in verse, 36 p. Published by the Miami Press, Cincinnati, Ohio.

The History of the United States Army, by William A. Ganoe. Chronological history of organization and activities. See Index under "Railroads" and "Surveys," "General Dodge," and so on. 609 p. Published by Appleton, New York, $5.00.

Labor Attitudes and Problems, by W. E. Atkins and H. D. Lasswell. Chapter 26, "Mechanisms of public control," discusses laws affecting railroad employees, p. 487-494, 520 p. Published by Prentice-Hall, New York.

Periodical Articles

Congress on Management Held at Prague. Summary of principal papers, comment on progress of Czecho-Slovak railroads and industries visited by delegates. Iron Age, August 28, 1924, p. 500-501.

Improved Rail and Track Supply Plant, by Gilbert L. Lacher. Colorado Fuel & Iron Company's preparations to handle 39-ft. milled-end rails. Iron Age, August 28, 1924, p. 495-499.

On the Soviet Trans-Siberian, by Kermit Roosevelt. Description of accommodations, operations and employees of the present Trans-Siberian and its connections. Scribner's, September, 1924, p. 272-280.

Railway Earnings and New Security Rates. Commerce Monthly, September, 1924, p. 11-12.

Replacement Driving Boxes on the New York Central, by L. C. Morrow. Practice of West Albany shops. American Machinist, August 21, 1924, p. 309-312.

The Story of Steel. Eighth installment on rolling steel rails. Scientific American, September, 1924, p. 174-175.

Waging with Oil a Winning Fight Against Corrosion. Purpose and equipment of spraying train of the Delaware, Lackawanna & Western. Compressed Air Magazine, August, 1924, p. 963-964.

Drag-line Work Was Necessary Before Shovels Could Be Used in the 530,000 Cu. Yd. Cut in Section 4

New 17-Mile Cut-off Eliminates Pusher Service

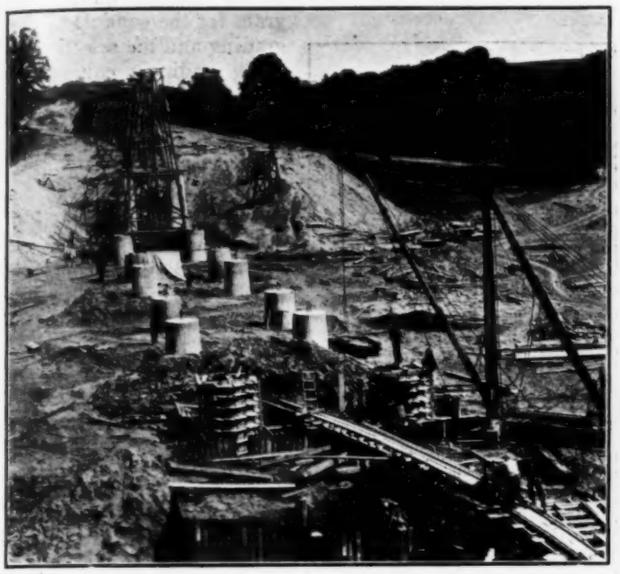
Unusually Heavy Construction Involved in Burlington Project to Expedite Coal Traffic

ONE OF THE HEAVIEST pieces of railway construction ever undertaken in Illinois is being pushed to completion on the Beardstown division of the Chicago, Burlington & Quincy, for the purpose of eliminating a pusher grade opposing the Burlington's heavy northbound coal movement from southern Illinois. It comprises the building of an alternate line on a practically continuous 0.25 per cent grade from a point two miles north of Beardstown, Ill., to Vermont, a total of 17¼ miles, at an estimated cost of about $143,000 per mile. The new line will be used as the northbound or upgrade line from the Illinois river bottom lands to the level of the prairie lands beyond the limits of the river valley, while the old line will be retained for all southbound trains and for all northbound passenger and local freight service.

The present project represents one of the final steps in a program undertaken by the Burlington almost 20 years ago for the development of a low grade line between the southern Illinois coal fields and St. Paul. A study of freight rates in relation to competitive coal prices led to the adoption of a 0.3 per cent grade against northbound or loaded movement and all new construction and reconstruction of existing lines between these points was committed to this plan. As a result, the completion of the present project will give the Burlington a continuous 0.3 per cent ruling grade opposing the coal movement over a distance of 682 miles. Most of the improvement work on this line was completed several years ago and in spite of the fact that the growth of traffic over this route during the last two decades has necessitated the construction of second track throughout almost the entire length of this route, the enormous cost of grade revision between Beards-

A Slide Caused Trouble in a 40-ft. Fill in Section 11

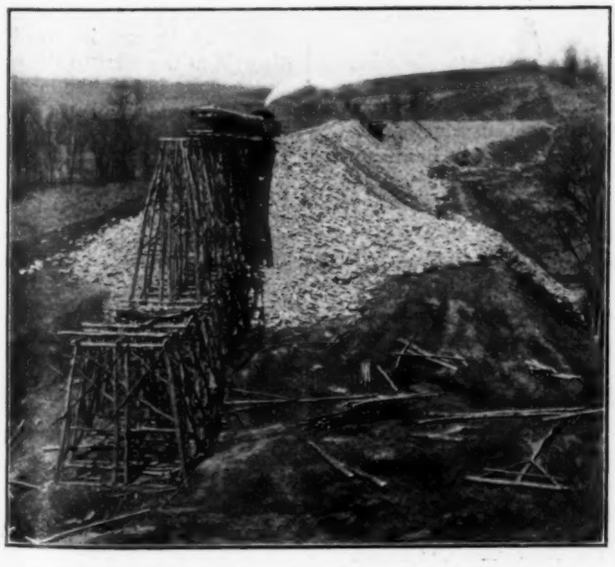
town and Vermont had led to a protracted postponement of that work, with the result that pusher service has long been maintained for the assistance of northbound trains rated for the 0.3 per cent ruling grade. With 280-ton 2-10-2-type road locomotives handling 5,600 to 6,000-ton trains, this requires the service of two 263-ton Mallet locomotives for each train.



Viaduct Pier Construction for the Sugar Creek Bridge

During periods of heavy business this northbound train movement has amounted to as much as 340 trains per month, or a total of 1,000 cars per day, so that it was necessary to maintain three Mallet locomotives regularly in the pusher service, supplemented a considerable portion of the time by a 280-ton Santa Fe type locomotive.

Owing to the prospect of the eventual elimination of the



A High Trestle Was Required for a 60-ft. Embankment

pusher grade, which covers only four miles of the distance from Beardstown to Frederick, the pusher grade was not double tracked. Therefore pusher service not only imposed a heavy charge on the coal traffic but caused appreciable delays to train movement, in cutting the pushers in and out and in the excessive occupancy of this stretch of single track by the ascending trains and the return movement of the pushers. This condition was reflected in the accumulation of considerable overtime by the northbound trains. It also required the spacing of these trains at a time interval of 1 hr. and 30 min., which led to considerable detention of trains in the terminal yards at Beardstown, and during periods of extremely heavy service, placed a definite limit on the capacity of the entire line.

An analysis of these operating conditions in comparison with a line not hampered by a pusher grade indicated an annual saving of $282,442 on the basis of an assumed volume of traffic obtained by averaging the actual business handled in the maximum and minimum months in a period of two years. This figure does not include savings due to reductions in distance, rise and fall, curvature, the elimination of the expenditure for the fourth pusher engine sometimes required, fewer stops to take water or generally better operating conditions. Physical conditions for the construction of a low grade line are particularly unfavorable. While the topography is characteristic of the valleys of large rivers in the middle west, broken by the short, deep ravines of small streams tributary to the river, it is remarkably rugged for country in which but little rock is encountered. Some idea of this is to be had from the fact that differences in elevation of 120 ft. occur

Shovel in Rock Excavation—Note Bench at Top

in a horizontal distance of 500 ft., although the total difference in elevation between the ends of the line is but 240 ft.

The old line follows the bottom lands from Beardstown to Browning, a distance of nine miles. It then turns abruptly to the north and follows the valley of a small creek, in making a climb of 146 ft. in the four miles to Bader with maximum grades of 1.2 per cent. From this point to Vermont the line occupies a ridge and the necessity for avoiding the numerous ravines at the heads of other tributaries to the Illinois river resulted in a rather circuitous route as indicated by the map. Thus, in this location the major portion of the ascent is made in the four miles between Browning and Bader, and, although the alinement for the remaining distance is not entirely satisfactory, the grades are moderate. The problem, therefore, in finding a new location was to discover one which would permit of distributing the change in elevation over almost the entire distance from Frederick to Vermont. The most obvious route lay in the Sugar creek valley, which lies in almost a direct line from Vermont to a confluence with the Illinois river about two miles north of Frederick.

The original preliminary surveys run along both sides of the valley of this stream indicated that a 0.3 per cent grade

line would complete the descent from Vermont to a connection with the old line in the vicinity of Frederick, but would involve very heavy cuts and fills and expensive construction costs. Additional surveys, made subsequently, disclosed that a 0.25 per cent grade line, although terminating the descent two miles south of Frederick and involving artificial support for the line south of Frederick on an embankment containing 450,000 cu. yd. of material, would fit the location in the Sugar Creek valley better than the 0.3 per cent grade line and would not involve any additional cost.

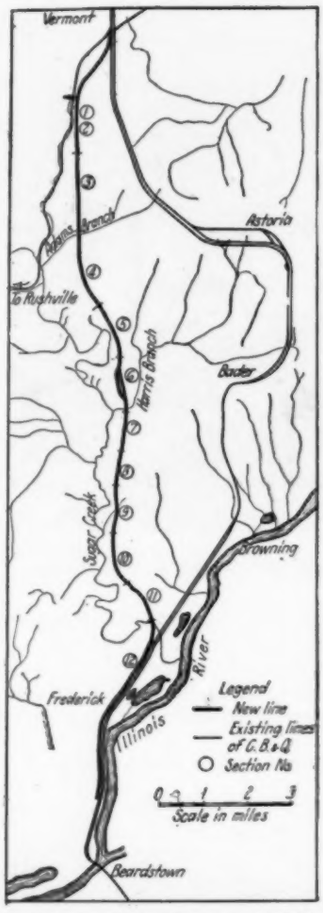
The adoption of the 0.25 per cent grade line was also influenced by another consideration. A line constructed to 0.3 per cent grade would have involved a continuous ascent for a distance of about 14 miles, whereas maximum grades on other portions of the coal route are comparatively short. Therefore, to have built a line for the climb out of the valley to the ruling grade with tonnage ratings based on an average speed of 10 miles per hour would have imposed such a slow movement of the trains on the ascent as to fix the capacity of the division definitely, as the number of trains that could be moved up the hill. The introduction of the 0.25 per cent grade will give the locomotives handling trains rated on the 0.3 per cent basis, sufficient advantage to expedite movement.

The new line is about 17¼ miles long, or three miles shorter than the old one. Curves are limited to a maximum of two degrees, and are compensated 0.04 per cent per degree. The roadbed on embankment is 20 ft. wide, with slopes of 1½ to 1, and all fills more than 25 ft. high are provided with 10-ft. beams. Cuts in earth have been given 1 to 1 slopes and a base width of 40 ft., this width being provided to take care of slides and to overcome the serious drainage problem introduced by the flat gradient which makes it necessary to construct ditches at a steeper gradient than that of the track. There are no cuts entirely in rock. Where rock is encountered in the lower portion of the cuts, the cut section is revised to conform to a 30 ft. roadbed and ½ to 1 slopes, this adjustment being effected by providing shoulders at the top of the rock stratum. An emergency siding 3,500 ft. long will be provided about midway of the line.

Characteristics of the Location

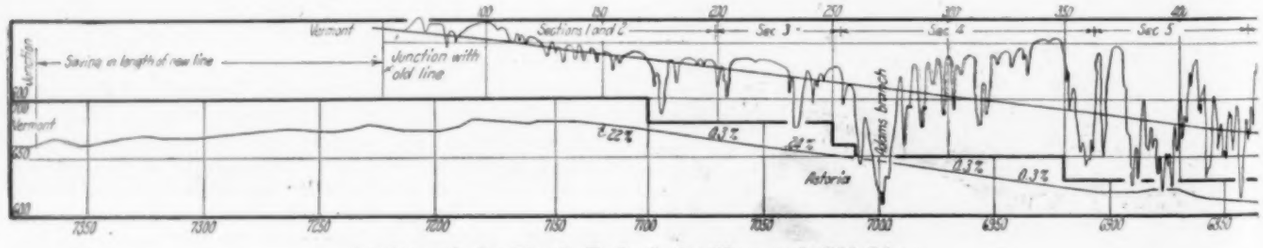
The location of the new line is notably direct. After passing through the town of Frederick it occupies a bench against the Illinois river bluffs for a distance of about two miles to a crossing of Sugar creek, whence it follows the east side of the Sugar creek valley to its head-waters near Vermont. For considerable distances the line and the stream are close together, in fact, at two points it was necessary to make channel changes to avoid awkward changes in the location or expensive bridge work. At other points the stream is as much as a mile from the railroad. However, it is only for short distances that the line presents the characteristics of a typical valley location with side hill work. This is explained by the fact that the sides of the Sugar creek valley are broken by the drainage ways of numerous small tributaries, ranging from narrow gullies to valleys as much as 2,000 ft. wide, these waterways being separated by ridges or shoulders from 100 ft. to a half mile or more in width. The differences in elevation are marked and the line passes from high embankments to deep cuts in distances of 100 to 200 ft., and even in the long cuts the ground surface is exceedingly irregular, requiring extensive surface ditching to intercept the drainage from the uphill side.

These conditions have had a marked influence on the program for the conduct of the grading and the selection of the grading equipment. With quantities running as high as 300,000 cu. yd. to the mile, large capacity shovels with standard-gage hauling equipment would normally be most economical, but with the large number of short deep cuts, entailing frequent shifting of the shovels, the use of small shovels was found of considerable advantage for a large part of the work. For the same reason, the frequent relaying of loading tracks pointed to the economy of narrow-gage cars, particularly as the hauls are usually short. But even for the work on the south end of the line, where a haul to a maximum of four miles was required, it was found desirable to use the smaller cars. Standard-gage equipment was not used on any portion of the work.



Relation of the New and Old Lines Between Beardstown and Vermont

Even in the larger cuts where large shovels were employed, it was found necessary to cut in small shovels at the start to shape up the cuts before the large excavating equipment could be used to advantage. In several cuts this was done with drag-line machines which wasted the material outside the slope lines. In several cases the ground slopes at the ends of cuts were so steep that considerable work had to be done with teams before even the small shovels could be cut in or tracks laid. In some cases where it was not practicable to lay track the small shovels loaded into wagons.



Profiles of the North End of the New and Old Lines

The project involves a total of 3,177,000 cu. yd. of excavation of which only a relatively small proportion is rock. The material other than rock is largely clay, mixed in some cases with sand and gravel. In general the material in the upper

portion of the cuts is a light clay, changing lower down to a heavy blue clay and in some places to shale.

Work Divided Into Sections

For the purpose of administering the construction work and the engineering, the line was divided into 12 sections, numbering from the north end, these sections ranging in

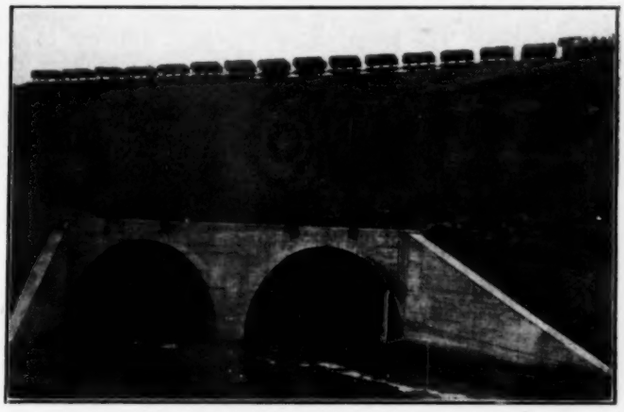
Work on the Lower Lift of the 100-ft. Fill at Adams Branch. The Base of the Temporary Cut in the Background Is 35 ft. Below Grade

length from 4,000 ft. for Section 8 to 221,400 ft. for Section 12. Sections 1, 2 and 3, covering a distance of 20,500 ft. and involving 142,900 cu. yd. of excavation, embracing rather light work, characterized by long cuts not exceeding 15 ft. in depth and short, high embankments, were later combined and handled as a single section. This work was done entirely with an Austin-Western grader with 20 wagons and a ¾-yd. shovel with 30 two-yard cars and three 10-ton Davenport locomotives.

The heaviest portion of the work is Section 4, which involves 682,700 cu. yd. of excavation in a distance of two miles. Not only is the work heavy throughout but it embraces the heaviest single cut and the largest individual fill. The cut extends from station 317 to station 352, with a depth ranging from 30 to 60 ft. and contains 530,000 cu. yd. of material consisting largely of yellow clay and heavy blue clay. The embankment extends from station 257 to 278, across the valley of Adams branch, with maximum depth of 100 ft. and requires 536,000 cu. yd. of fill.

This section differs to a certain extent from the others on the line in that the location is further removed from the Sugar creek valley. Nevertheless, it is crossed by frequent drainages from east and west which have the effect of introducing such steep ground slopes as to make it necessary to do considerable work in preparation for the larger steam shovels. This was done with two Erie ¾-yd. shovels loading into wagons and two drag line excavating machines, which wasted nearly 87,000 cu. yd. outside the slope lines. One of these was a 1-T Monighan, the other a Bucyrus 50-B, which was later converted into a shovel with a 1¾-yd. dipper, loading into 60 four-yard cars. Later this shovel was replaced by a 70-C Bucyrus on caterpillar treads supplemented by a 1¼-yd. Osgood shovel which replaced the two Erie shovels.

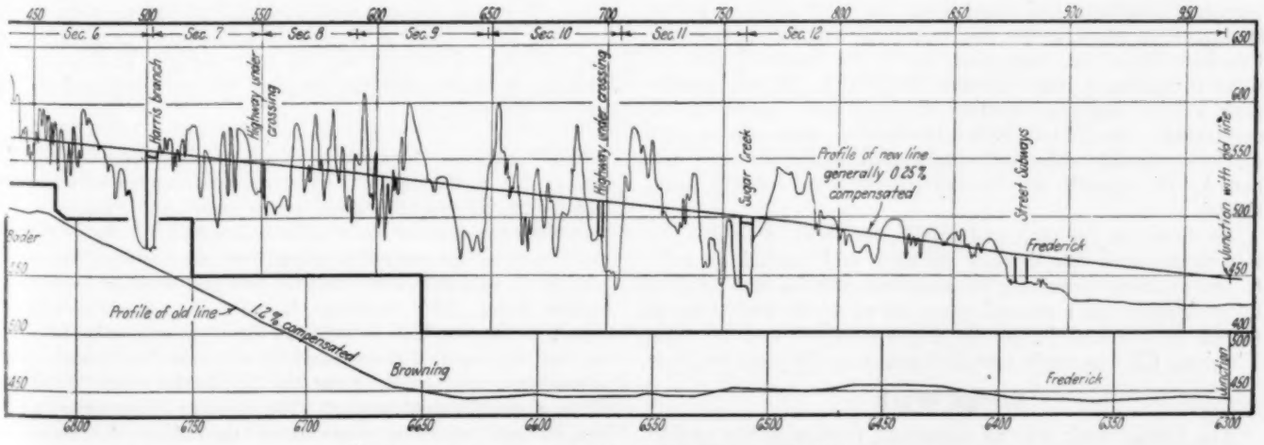
Of the total quantity of material in the large cut, 59,000 cu. yd. were placed in a fill 7,000 ft. long adjoining its south end. The remainder, together with that from a series of six



The Double 18-ft. Arch Culvert for Adams Branch. The Finished Top of the Fill Is 35 ft. Above the Train

short cuts to the north, was used in a few small fills and in the 100-ft. fill at Adams branch. Here, also, the work was complicated by steep ground slopes. This fill was made in two lifts, the lower one with a maximum height of 65 ft. and the second with an average height of 35 ft. Dumping trestles were provided for each lift, but to obtain access to the track on the trestle for the lower lift it was necessary to excavate a cut 300 ft. long through a shoulder flanking the south end of this embankment to a depth of 35 ft. below the grade line. Later this cut must be refilled when the final lift on the fill is made.

In Section 5 a cut 900 ft. long with a maximum depth of



Profiles of the South End of the New and Old Lines

68 ft., containing 151,000 cu. yd., imposed the obstacle of an abrupt face to a marked degree, the elevation of the ground rising to a height of 60 ft. in a distance of 180 ft. from the grade point at the south end. No particular difficulty was involved in getting the shovel into the top of the cut from the nearby highway but to deliver the material to the adjacent fill to the south it was necessary to support the tracks on a series of benches cut in the face of the hill in the form of a double switchback. A ¾-yd. shovel was used here with 2-yd. cars hauled by three 7-ton gasoline locomotives.

A considerable part of Section 5 and the north end of Section 6 are in close proximity to Sugar creek and except for several long through cuts the work is typical side hill grading with a succession of cuts and fills, many of which are not more than 200 ft. long. The south end of Section 6 comprises a large fill across the valley of Harris branch. This is 2,000 ft. long with a maximum height of 85 ft., and contains 334,000 cu. yd. It is being built in three lifts. A base of 100,000 cu. yd. was made from borrow with teams, while the two upper lifts are now being made by dumping from trestles. The lower trestle was built adjacent to the west slope and the embankment widened by throwing the track and spreading until the east slope was reached.

Work on other sections is of much the same general character, except that, toward the south end of the line, rock is encountered at the bottoms of the cuts. In Section 10 a short cut 75 ft. deep had such a steep slope at the upper end that it was necessary to build a trestle to support the tail track for the loading equipment.

In Section 7, which contains only about 100,000 cu. yd. of grading, in a distance of 4,700 ft., small revolving shovels and two excavating graders were used, all of the hauling being done with wagons. In Section 9 a 70-ft. cut only 400 ft. long imposed the problem of steep slopes to an intensified degree. In placing material from this cut and one or two smaller ones in several short but high embankments, the problem of disposing of the material was exceedingly difficult even for wagons and required the construction of a wagon road winding around the outer faces of the shoulders and back against the heads of the intervening gullies to reach the bases of the embankments.

Heavy Work at the South End

Sections 11 and 12, which were combined, comprised the largest unit in point of length and total volume of grading. The total length is five miles and the grading amounts to 749,800 cu. yd. of embankment. In this unit the embankment exceeds the neat excavation of the cuts by 360,000 cu. yd. and occurs largely in the southerly four miles, which embraces the long approach of embankment south of Frederick. This contains 450,000 cu. yd. of material, an amount considerably in excess of the estimated quantity owing to the fact that a settlement of about three feet in the natural ground surface took place under the weight of the filling material. Considerable of the excavation was in the nature of side hill work in cutting a bench against the bluffs. It was handled with a 70-C Bucyrus, loading six-yard cars, hauled in 16-car trains. Six 22-ton Porter locomotives were used in this service. Considerable preliminary work had to be done with two ¾ yd. shovels in shaping up the cuts for the heavy shovel.

As shown on the map and profile, the location in this section of the work cuts through the town of Frederick on a 25-ft. embankment, requiring the purchase of town lots occupied by 30 houses and a general store, all of which had to be removed or wrecked before the embankment could be built. The long fill was made entirely from a trestle built to grade.

Bridge Work

The bridge work was an important feature of the project, the two largest items being steel viaducts across Sugar creek and Harris branch, respectively. The first is 60 ft. high by 500 ft. long and the second 90 ft. high by 458 ft. long, and both consist of 30-ft. tower spans and 60-ft. intermediate spans, while the one across Sugar creek has a 90-ft. span at the stream crossing. The trestle towers are supported on cylinder pedestals, supported on rock at Harris branch and on piles at Sugar creek. The location through Frederick involved the construction of two subways for street undercrossings.

The deep cuts and high fills which prevailed throughout the entire length of the line afforded excellent opportunity for the elimination of grade crossings with highways, with the result that six overcrossings and two undercrossings are to be built. In several of the former old railroad spans will be utilized while the latter will consist of pile trestle openings. Only one culvert was built in place, a double 18-ft. arch under a 100-ft. fill across Adams branch, containing 4,000 cu. yd. of concrete. Material for the construction of this culvert was delivered to the site over a temporary spur 1¼ miles in length extending from the Rushville line of the Burlington, which lies to the west of the new line. All of the remaining waterway openings are concrete pipe culverts from 18 in. to 48 in. in diameter, the necessary waterway being provided in some cases by laying two or three lines of pipe. In one point of Section 3 where a 45-ft. embankment crosses a ravine on a sharp skew, it was necessary to provide 400 ft. of pipe culvert.

The estimated total cost of the new line is $2,470,760. The work is under the general direction of A. W. Newton, chief engineer, while the more intimate details, including the establishment of the location, have been supervised by C. L. Persons, assistant chief engineer, lines east. William Thomas is construction engineer, assisted by three resident engineers, H. R. Howes, F. H. McKinney and R. W. Scott. Morris & Daugherty are the general contractors and are doing the work on Section 4 and Sections 11 and 12 with their own forces, employing sub-contractors on the other sections, as well as for the bridge work. The work was started on June 15, 1923, with the anticipation that it would be completed during the present summer, but weather conditions interfered so seriously with the work that this schedule could not be maintained. An almost impassable condition of the highways during the winter months and for a considerable period following all heavy rains, was an important disturbing factor not only in delaying the moving in of equipment but in obstructing the delivery of supplies to the various construction units. The general contractors maintain a fleet of motor trucks for supply service and although they spent considerable money in grading and surfacing highways, there were times when the use of the trucks had to be abandoned in favor of teams hauling extremely light loads. The work, however, is being actively prosecuted. For example, in May, 1924, 11 steam shovels were operated including three 70-C and one 50-B Bucyrus shovels in addition to two-team outfits, and moved 237,000 cu. yd. of material. If this rate of progress is maintained the grading will be completed by the end of the year.

THE TELEGRAPH DEPARTMENT of the Detroit, Toledo & Ironton reports that in the month of June the total number of telegrams sent by the officers and agents of the road was 15,730, and that almost 50 per cent of these were transmitted by the company's radio system, the remainder going over the railroad wires. In addition to this traffic, the railroad sent 820 messages over commercial wires. This statement is made in connection with an appeal, in the "D. T. & I. Railroad News" to economize words in writing telegrams. For one example, this appeal recommends that in sending a telegram about car No. 721,516 the words "seven two fifteen sixteen" should be used. The company is putting up a new long-distance telephone wire circuit throughout the length of its road.

Ample Car Supply for Northwestern Crops Assured

RAILROADS in the Northwest are in the best physical condition on record to handle the crop movement this year and present indications are that the usual heavy crop shipments will be moved this fall without any transportation difficulties, according to M. J. Gormley, chairman of the Car Service Division of the American Railway Association.

Addressing the grain and grain products committee of the Northwestern Regional Shippers' Advisory Board at a meeting in Minneapolis on September 6, Mr. Gormley said:

"With the ideal situation as to equipment now on the northwestern lines, with the very great improvement in their transportation capacity, insofar as equipment alone is concerned, and regardless of other improvements made in facilities that add greatly to the capacity of the railroad, we believe we are fully justified in the assertion that the crop produced in the Northwestern region this year will be moved without a car shortage, provided it is not moved in any one period in such volume as to over-tax the terminal facilities for unloading promptly. In other words, barring unusual delay in unloading at destination, a car will be available for movement whenever it is wanted. This, of course, does not necessarily mean that there may not be temporary shortages due to operating difficulties from time to time but there will be no shortage as that term is generally known and as heretofore recognized in the grain shipping territories.

"So far as the records of the Car Service Division disclose, there has never been a more ideal situation from the standpoint of supply of equipment for handling the northwestern grain movement. The railroads serving this territory were never in better physical condition than they are today and this from every standpoint, as well as that of equipment."

Mr. Gormley said that the ten principal northwestern lines, including the Chicago, Burlington & Quincy and the Chicago, Rock Island & Pacific, of the central region, on August 15 had 237,692 box cars on their lines, slightly more than 100 per cent of the total number of box cars which they own. Those same roads, he said, had on their lines on the same date 161,814 box cars of their own ownership, 13,882 in excess of the number which they had on the same day last year. A large percentage, he added, of the cars that are owned by the northwestern lines that are off their own lines are on those of other railroads within the northwestern and central western districts. Since May 4, 1924, 813 empty western owned box cars have been delivered daily by eastern lines at Chicago and St. Louis. Latest figures, Mr. Gormley said, show no let up in this daily average of movement.

"Grain cars stored on northwestern lines in readiness to handle the grain movement totaled 35,094 on August 23, this year, an increase of 13,872 over the number in storage on the same day in 1923," Mr. Gormley added. "Reports also showed that on August 15, this year, the eight principal northwestern railroads had 919 serviceable locomotives in storage and in readiness for service whenever transportation conditions warranted. On August 15, 1923, those same roads had only 322 serviceable locomotives in storage."

Not only has there been a substantial improvement, Mr. Gormley said, from the standpoint of supply of equipment in the northwestern region, but the railroads traversing that territory have also greatly increased the potential capacity of their lines.

"The average carrying capacity of the box cars owned by the Northern Pacific since 1915 has increased from 37.9 tons to 40.1 tons," added Mr. Gormley, "while the tractive effort of Northern Pacific locomotives has increased from 33,326 to 38,068 lb. On the Great Northern the average carrying capacity of box cars has increased from 35.5 to 37.9 tons per car while the tractive effort per locomotive has increased from 36,704 to 40,110 lb. The Soo Line has also increased the average capacity of its box cars from 30.6 to 33.5 tons per car and the tractive power per locomotive from 26,331 to 30,009 lb. Similar increases in the carrying capacity of their box cars and tractive effort of locomotives have also been made by other railroads in the Northwestern region."

Analysis of Motor Car Operating Cost

IN A RECENT ISSUE of the *Railway Age*,* Clarence E. Gilmore, chairman of the State Railroad Commission of Texas, was quoted with respect to the possibilities of the gasoline motor car on short lines in a statement, in the course of which he referred to the results obtained from a year's service of a gasoline motor car on the Gulf, Texas & Western. The detailed statement of W. Frank Knox, receiver of the railroad, from which the total cost of operation and total revenues were quoted by Mr. Gilmore, contains an interesting detailed analysis of both costs and revenues for the year ending June 30, 1924. The car with which these results were obtained is a Brill Model 55. An abstract of the receiver's statement follows:

MILEAGE AND PASSENGERS CARRIED

Number of trips run during year		365
Daily mileage July 1, 1923, to September 19, 1923 (Mineral Wells to Megargel and return)		168
Daily mileage September 20, 1923, to June 30, 1924 (Mineral Wells to Seymour and return)		216
Total miles run during year		75,168
Revenue passengers carried during the year		19,981
Average daily revenue passengers		54.8
Non-revenue passengers carried during year		1,703
Average daily non-revenue passengers		4.7
Total passenger-miles for year		835,142
Average length of ride, miles		41.79

FIXED CHARGES

Depreciation:		
Body—Estimated life, 10 years; value of body $10,000	$1,000.00	
Motor—Estimated life, 3 years; value of motor $7,000	2,333.33	
Interest at 8 per cent on average investment	800.00	
Insurance per annum	124.99	
Total fixed charges		$4,258.32
Average per month	$354.86	

OPERATING EXPENSE

Motorman 75,168 miles, at 3.3 and overtime	$2,531.13	
Trainman 75,168 miles, at 3.1 and overtime	2,367.86	
Passenger train car repairs	135.01	
Motor equipment of car	768.00	
Gasoline, 10,959 gallons	1,632.86	
Lubricants for train locomotives	305.25	
Other supplies	16.10	
Train supplies and expenses	599.91	
Advertising	103.08	
Station employees	197.28	
Injury to persons	88.53	
Total operating expenses		8,745.01
Average per month	$728.75	
Total of fixed charges and operating expenses		$13,003.33
Average per month	$1,083.61	

REVENUES FROM OPERATION

Passenger revenues for year:		
From outbound passengers	$13,467.64	
From inbound passengers	15,652.33	
Total		$29,119.97
Mail revenues for year		6,438.38
Total passenger and mail revenues for year		$35,558.35

PROFIT AND LOSS FROM OPERATION

Passenger revenue for year	$29,119.97	
Mail revenue for year	6,438.38	
		$35,558.35
Depreciation, interest, insurance, etc., for year	4,258.32	
Operating expenses for year	8,745.01	
		13,003.33
Total profit for year		$22,555.02
Average monthly profit	$1,879.58	

*See the *Railway Age* of August 23, 1924, page 345.

Cost and Revenue Averages

	Earnings	Expenses
Per day	$97.42	$35.63
Per train-mile	.473	.173
Per passenger	1.45	.65
Per passenger-mile	.035	.016

The motor car was placed in operation on June 26, 1923, at a cost of $16,926. The car was still running in August, 1924, with the original motor and driving units which appeared to be good for some months before requiring general repairs. The average cost of the gasoline consumed by the car was 15 cents per gallon and the car has made an average of 7 miles per gallon of gasoline used.

Freight Car Loading

Washington, D. C.

Revenue freight car loading passed the million car mark during the week ended August 30 for the first time this year, having increased sharply during the last two weeks of the month. The total for the week was 1,020,339 cars, a decrease of only 71,811 cars as compared with that of the corresponding week of last year, whereas for many weeks the loading had been as much as 100,000 cars below that of last year. As compared with 1922 this was an increase of 96,533 cars. The increase in comparison with the previous week's loading was over 38,000 cars. Last year the million car mark was attained in the latter part of May.

The large increase as compared with the previous week was due to especially heavy loading of miscellaneous freight, which amounted to 377,350 cars, of grain and grain products, which amounted to 68,837 cars, and to a considerable increase in coal loading as compared with earlier weeks. This amounted to 168,584 cars. Loading of grain and grain products, merchandise and miscellaneous freight showed increases as compared with last year as did the total loading in the Pocahontas, Southern, Central Western and Southwestern districts. The Car Service Division's summary follows:

Revenue Freight Car Loading

Week Ended August 30, 1924

Districts	1924	1923	1922
Eastern	236,263	255,646	223,475
Allegheny	202,426	232,741	196,523
Pocahontas	47,903	45,183	30,057
Southern	140,206	137,294	114,716
Northwestern	151,917	182,488	155,043
Central Western	167,641	167,505	150,628
Southwestern	73,983	71,293	53,364
Total Western districts	393,541	421,286	359,035

Commodities			
Grain and grain products	68,837	54,599	53,945
Livestock	32,403	38,641	32,093
Coal	168,584	206,578	149,227
Coke	7,841	13,970	8,383
Forest products	69,252	77,153	58,346
Ore	48,291	78,193	62,467
Merchandise, l. c. l.	247,151	246,734	233,252
Miscellaneous	377,350	376,282	236,093
Total	1,020,339	1,092,150	923,806
August 23	982,248	1,069,915	879,902
August 16	952,888	1,039,938	846,266
August 9	942,198	973,750	842,690
August 2	945,731	1,033,466	842,663
Cumulative total January 1 to date	31,556,611	33,155,456	27,607,701

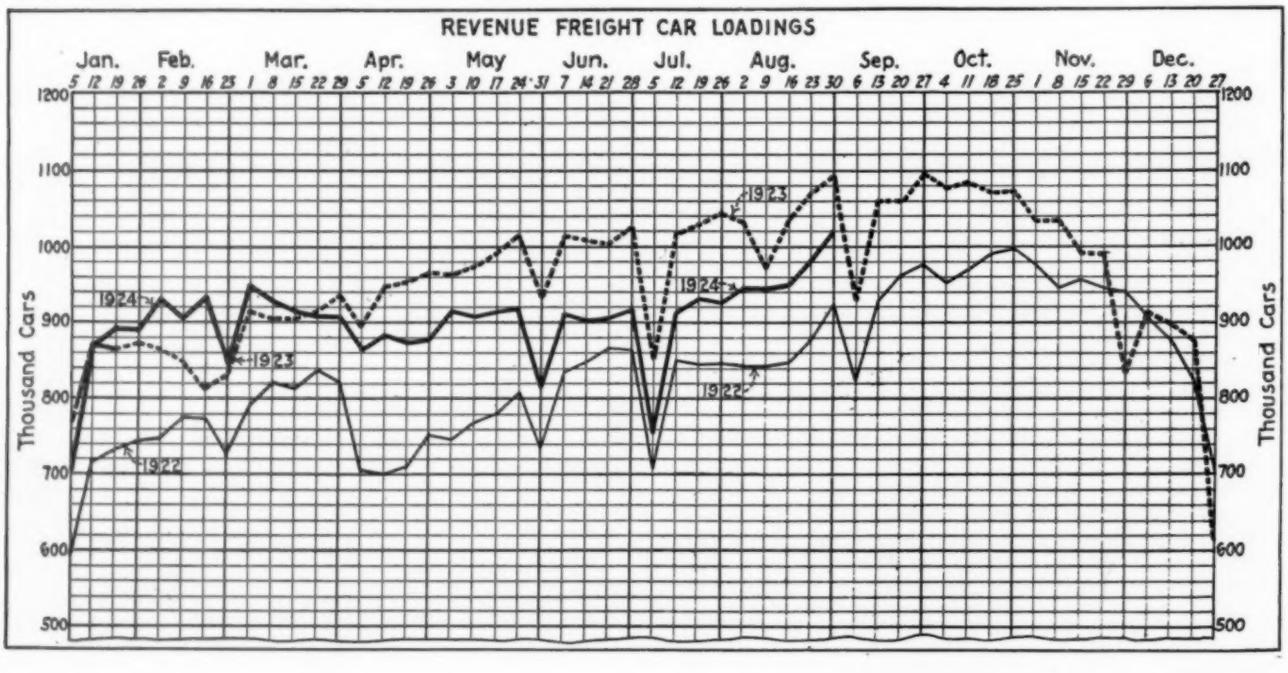
Loading of revenue freight this year as compared with the two previous years has been as follows:

	1924	1923	1922
4 Weeks of January	3,362,136	3,373,965	2,785,119
4 Weeks of February	3,617,432	3,361,599	3,027,886
5 Weeks of March	4,607,706	4,581,176	4,088,132
4 Weeks of April	3,499,210	3,764,266	2,863,416
5 Weeks of May	4,474,751	4,876,893	3,841,683
4 Weeks of June	3,625,472	4,047,603	3,414,031
4 Weeks of July	3,526,500	3,940,735	3,252,107
5 Weeks of August	4,843,404	5,209,219	4,335,327
Total	31,556,611	33,155,456	27,607,701

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended August 30 amounted to 51,979 cars, an increase of 1,091 over the previous week. Of this improvement there were 595 cars in the Eastern division and 496 cars in the Western division. Coal loading improved in both divisions; merchandise and miscellaneous freight were heavier in the East and lighter in the West, and grain loading showed a gain of 191 cars in the West. Compared with the same week last year there was a decrease of 4,899 cars.

	For the week ended		
Total for Canada	1924		
Commodity	Aug. 16 Cars	Aug. 23 Cars	Aug. 30 Cars
Grain and grain products	3,786	3,869	3,987
Live stock	2,407	2,620	2,744
Coal	4,956	4,777	5,499
Coke	149	206	168
Lumber	3,618	3,601	3,535
Pulpwood	1,705	1,727	1,736
Pulp and paper	2,021	1,917	1,801
Other forest products	1,951	2,345	2,236
Ore	1,560	1,588	1,405
Merchandise, l. c. l.	14,928	15,063	15,612
Miscellaneous	12,040	13,175	13,256
Total cars loaded	49,117	50,888	51,979
Total cars loaded from connection	28,094	28,270	28,388
Total cars loaded for corresponding week, 1923	51,026	53,947	56,878
Cumulative loading to date—1924	.....	.....	1,853,006
Cumulative loading to date—1923	.....	.....	1,751,749



Railroads Pay Higher Wages Than Industries

In Basic Wages and Recent Increases Railroad Employees Have Benefited More Than Other Workers

RAILROAD WAGES continue to lead those of manufacturing industries. This conclusion was reached by the National Industrial Conference Board after making a thorough investigation (Research Report No. 70) of the trends of wages, hours and employment of railway labor as a whole from 1914 to the end of the first quarter of this year. In the first quarter of 1924 the average hourly earnings of all railroad employees were 60 cents, which is 136 per cent greater than the hourly earnings in 1914 and 10 cents below the highest peak of 1920. The purchasing power of the weekly earnings of these employees in the first quarter of 1924 was 20 per cent greater than in 1914 and slightly greater than in the second half of last year. This condition is due to a slight increase in earnings and a slight decrease in the cost of living.

In comparing the trends of wages for skilled labor in foundries and machine shops and unskilled shop labor on the railroads, the board found that the railroad employees have benefited far more from wage increases since 1914 than have the employees of manufacturing industries. In the first quarter of 1924 wages of skilled labor in foundries and machine shops were 108 per cent greater than in 1914 but those of railroad skilled shop labor at the end of last year were 142 per cent above the 1914 level and have advanced still further to 72.2 cents an hour in the first quarter of this year.

In general, the board's investigation showed that railroad labor as a whole is materially better off now than in 1914. It showed that the average working week per employee was considerably shorter and the purchasing power of weekly earnings substantially greater.

General Trends of Wages

The average hourly earnings of railroad workers in general in the first quarter of 1924, as already stated, were 60 cents, 136 per cent greater than the hourly earnings in 1914. The average weekly earnings of all railroad men in the first quarter of this year were $29.73, or 99 per cent greater than the weekly earnings of $15.17 in 1914. The relatively smaller increase of the weekly earnings as compared with the hourly earnings is due to the shortening of the average working week by more than 10 hours. The purchasing power of the weekly earnings in the first quarter of 1924 was 20 per cent greater than in 1914. The trend of the purchasing power was downward during 1923 but on account of the slight increase in earnings and a decrease in the cost of living, the purchasing power rose again in the first quarter of this year.

The average hourly earnings of railroad skilled shop labor in the first quarter of 1924 were 72.2 cents, compared with 29.8 cents in 1914, an increase of 142 per cent. Weekly earnings had increased 101 per cent, or from $16.88 in 1914 to $33.99 this year. The purchasing power of the earnings of this class of workers in the first quarter of this year was 23 per cent greater than in 1914.

The wages of unskilled railroad labor were 130 per cent greater this year than in 1914, the current hourly rate in the first quarter of this year being 37 cents. Weekly earnings in the first quarter of this year were $17.85, or 89 per cent greater than in 1914. Their purchasing power also increased 15 per cent in the 10-year period.

The position of the train and engine service employees has not been so advantageous as that of the other groups. Wages during the first quarter of this year were 84 cents an hour, 96 per cent higher than in 1914 and weekly earnings $43.41, or 70 per cent higher than 10 years ago. The purchasing power of the wages of these employees in the first quarter of 1924 was only 4 per cent greater than in 1914 in spite of the increased wages. It is significant that the length of the average working week per employee in the first quarter of this year was 51.7 hours compared with 59.6 hours in 1914. The decrease in the length of the average working week of all the major groups of railroad labor since 1914 has been greater than the decrease in the length of the average working week of the train and engine service workers.

Changes in Purchasing Power

Going more closely into the purchasing power of the hourly earnings, or the "real" hourly earnings, of railroad employees, the board found that in all years except 1916 and 1917, the "real" hourly earnings of railroad employees in general have been greater than in 1914. These reached their highest points, 63 per cent above the 1914 level, in the second quarter of 1921, after the cost of living had receded materially from its 1920 peak and before the wage reduction of 1921 was made. Since that reduction "real" hourly earnings have remained between 41 per cent and 51 per cent higher than in 1914. In the first quarter of 1924 the "real" hourly earnings were 44 per cent greater than in 1914. The "real" weekly earnings of the employees in general did not go so high above the base year as did the hourly earnings owing to the decrease in the length of the average working week which took place on the widespread adoption of the eight-hour day. The "real" weekly earnings taken as a whole have not been lower than in 1914, however, and early this year were more than 20 per cent greater than in 1914.

With regard to the "real" earnings of skilled railway shop labor, it was found that during the greater part of the 10-year period these have had an upward trend. "Real" hourly earnings for the years 1916 and 1917 were less than in 1914 but this was true of "real" weekly earnings during 1917 only. In the second quarter of 1921 the "real" hourly earnings were 73 per cent greater than in 1914 but the relation dropped to 56 per cent in the third quarter of 1921 due to the wage reduction. In the latter half of 1922, on account of strike conditions, "real" hourly earnings were abnormally high. Since that time, however, they have been relatively steady and in the first quarter of 1924 were 48 per cent higher than in 1914. The "real" weekly earnings this year were 23 per cent above the level of 1914.

The "real" earnings of unskilled labor, both hourly and weekly, have at all times since 1917 been greater than in 1914. The "real" hourly earnings of this class of employees in the first quarter of 1924 were 40 per cent greater than their "real" earnings in 1914 but the "real" weekly earnings were only 15 per cent higher, their lowest point since 1920.

The "real' earnings of the train and engine service employees did not increase so consistently as did those of the other classifications. Although the average hourly and weekly earnings of this class of employees rose constantly from 1915 to the second quarter of 1920, the increases in the cost of living were more rapid. Consequently their "real" earnings during this period were less than in 1914. Since the third quarter of 1920, following the increase in wages, their "real" weekly earnings have been greater than in 1914 with the exception of the latter half of 1921. Since the decrease in wages of July 1, 1921, the "real" hourly earnings have remained rather steady, ranging from 18 per cent to 26 per cent above those in 1914. The "real" weekly earnings, on the other

hand, have fluctuated from 3 per cent less to 13 per cent more than those of 10 years ago, principally because of the variations in the length of the average working week. In the first quarter of this year the "real" hourly earnings of all train and engine service labor as a whole were 20 per cent greater, and their "real" weekly earnings 4 per cent greater, than in 1914.

Comparison of the average hourly earnings of the several classes of train and engine service employees revealed that the wages of the less skilled employees, the firemen and brakemen, were increased relatively more than the wages of the more highly skilled, the engineers and conductors, both during the period of federal control and by the increases in wages awarded by the Labor Board during 1920. Although the engineers in road freight service received weekly wages this year which were 63 per cent greater than in 1914, their "real" weekly wages were 1 per cent less than 10 years ago. The firemen in road freight service, on the other hand, benefited by increases in weekly earnings of 83 per cent, their "real" weekly earnings during the first quarter of this year being 12 per cent greater than in 1914. The conductors in road freight service received increases in weekly wages of 69 per cent but their "real" weekly earnings this year were only 3 per cent greater than in 1914. Road freight brakemen were receiving weekly wages during the first quarter of 1924 which were 90 per cent greater than those of 1914, the purchasing power of these earnings being 16 per cent greater.

The wages of employees in passenger service were increased during the 10-year period but relatively not so much as those of employees in the road freight and yard service. At no time since 1914 have the "real" weekly earnings of either passenger engineers or conductors been greater than they were in that year. In the first quarter of this year the average weekly earnings of the passenger engineers were 42 per cent higher than in 1914 but the purchasing power of these wages was 13 per cent less than that of the wages in 1914. The weekly earnings of passenger conductors were 52 per cent greater this year than in 1914 but the "real" weekly earnings were 7 per cent less. Passenger firemen have received increases in weekly earnings of 77 per cent and their "real" weekly earnings are now 8 per cent greater than in 1914. Passenger brakemen benefited by increases in weekly earnings of 86 per cent and an increase in the purchasing power of their wages of 13 per cent.

A comparison of the earnings of road freight conductors and road passenger conductors over the 10-year period discloses a change in the relative positions of the two classes. In 1914 the weekly earnings of road freight conductors were only 86 per cent as great as those of passenger conductors. In the first quarter of this year, however, the proportion had risen to 95 per cent. The weekly earnings of freight brakemen were less than 1 per cent higher in 1914 than those of the passenger brakemen and although during the greater part of the intervening period the differential between them was much wider, by the first quarter of 1924 it had reverted almost to its 1914 position. Earnings of freight service employees had a wider range than the earnings of the passenger service employees due to greater fluctuation in the volume of freight traffic. In 1914 the weekly earnings of freight engineers were 15 per cent less than those of passenger engineers. When wages were at the peak in 1920, however, the freight engineers' weekly earnings were 5 per cent greater than the earnings of the passenger engineers. In the first quarter of this year freight engineers' weekly earnings were only 2 per cent less than those of passenger engineers. A similar but less extensive change has occurred in the relations of the firemen in the two branches of service. In 1914 the weekly earnings of road freight firemen were 88 per cent as large as the earnings of passenger firemen. At the peak in 1920 the earnings were practically equal but in the first quarter of 1924 the ratio was back to 92 per cent.

In general, from the standpoint of the purchasing power of weekly earnings, the position of the men in train and engine service in the first quarter of 1924 was slightly better than in 1914. "Real" weekly earnings of these employees as a whole were in the later period 4 per cent higher than in 1914. In the first quarter of 1924 "real" weekly earnings of the following classes of train and engine service employees were less than in 1914: road passenger engineers, 13 per cent less; road passenger conductors, 7 per cent less; yard engineers, 2 per cent less; road freight engineers, 1 per cent less. In the same period the "real" weekly earnings of the following classes were greater than in 1914: yard brakemen, 2 per cent greater; road freight conductors, 3 per cent greater; yard conductors, 4 per cent greater; and road passenger firemen, 8 per cent greater; road freight firemen, 12 per cent greater; road passenger brakemen, 13 per cent greater; road freight brakemen, 16 per cent greater; and yard firemen, 21 per cent greater.

Railroad and Industrial Wages Compared

The differences in hourly earnings of the various groups of railroad labor and the corresponding groups of manufacturing labor which existed in 1914 were practically the same in the first quarter of 1924, in so far as, first, the groups of railroad workers as a whole and, second, unskilled railroad laborers as compared with similar divisions among the male workers of the manufacturing industries were concerned. The only class of labor in which differences in hourly earnings have changed materially is the skilled labor group and the skilled railroad laborers have had all the better of this change. The difference in weekly earnings between railroad and manufacturing labor as a whole has changed to favor the factory workers. The principal reason for this change is that the average working week on the railroads has been shortened to a greater extent than the average working week in the manufacturing industry, the working week of railroad labor in general having been longer in 1914 than that of manufacturing labor. Comparing the hourly earnings of railroad shop labor as a whole with the earnings of male shop labor of other industries, it was found that in the first quarter of 1924 the average hourly earnings of manufacturing workers were 59.4 cents and railroad workers 60 cents. In 1914 the hourly wage of the former was 26 cents and of the latter 25.4 cents. Thus in hourly earnings the railroad workers have forged slightly ahead.

Average weekly earnings show a different trend, however, due to the difference in length of the average working week. In 1914 the wage earners in manufacturing industries received an average of $13.30 for 51.2 hours and railroad workers received $15.17 for 59.7 hours. In the first quarter of this year the weekly earnings of all manufacturing workers were $28.76, and the weekly earnings of all railroad shopmen were $29.73. The railroad shopman had an average week of 49.6 hours, while the factory week was 48.1 hours. Contrasting the "real" weekly earnings of the two groups, the railroad wage earners in the first quarter of this year received "real" weekly earnings 20 per cent greater than in 1914, while the purchasing power of the weekly earnings of manufacturing workers early this year was 32 per cent greater than 10 years ago. The manufacturing group, therefore, was in a more advantageous position in the last three quarters of 1923 and the first quarter of 1924 than the railroad group, as compared with their relative positions in 1914.

A comparison of the trend of the wages of skilled labor in foundries and machine shops and skilled shop labor on the railroads reveals strikingly the greater increases in wages which the latter group has received. Average hourly earnings were nearly equal in 1914: 30.7 cents in the foundries, 29.8 cents on the railroads. By 1920, however, the railroad group had forged far ahead, having increased its wages 190 per cent since 1914 as compared with 127 per cent increase of the skilled machine shop workers. In the first quarter of this year the situation was that the hourly earnings of

skilled foundry labor were 108 per cent greater than in 1914 but the hourly earnings of skilled railroad shop labor were more than 142 per cent greater than 10 years ago.

A reversal in position, therefore, has taken place in the hourly earnings of the two groups. Whereas in 1914 the hourly earnings of skilled foundry labor were 9 cents more than the hourly earnings of railroad skilled shop labor, in the first quarter of 1924 they were 8.2 cents less than those of the railroad group. The average weekly earnings of railroad skilled shop labor have not been relatively so high due to the sharp decrease in the length of the average working week. The weekly earnings of the foundry and machine shop skilled workers in 1914 were 12 per cent less than the weekly earnings of the railroad workers and in the first quarter of 1924 were 8 per cent less.

The outstanding feature of the comparison of the wages of unskilled railroad labor and unskilled labor in the manufacturing industries is that the earnings, hourly and weekly, of the latter group, exceeded those of the former in every period for which comparisons are possible except one, the second quarter of 1921. In 1914 the average hourly earnings of unskilled manufacturing shop labor were 20.3 cents and of unskilled railroad shop labor, 16.1 cents. In the first quarter of this year unskilled manufacturing labor received average hourly earnings of 47.3 cents, 132 per cent above the 1914 level, and unskilled railroad labor received average hourly earnings of 37 cents or 130 per cent above the 1914 level. The relative differential between the two groups, then, was nearly the same early this year as in 1914.

The average weekly earnings of unskilled manufacturing labor in 1914 were $10.71, based on a week of 52.7 hours, and at that time the average weekly earnings of unskilled railroad labor were $9.42 based on a week of 58.5 hours. In the first quarter of 1924 the differential in weekly earnings was wider. In that period unskilled labor in manufacturing received average weekly earnings of $23.48 or 119 per cent more than in 1914 and unskilled railroad labor average weekly earnings of $17.85 or an 89 per cent increase in 10 years. In 1914 the average weekly earnings of the unskilled worker in manufacturing were 14 per cent greater than those of the unskilled railroad worker. In the first quarter of this year they were 32 per cent greater. This difference in weekly earnings has increased because of the change in relative lengths of the average working weeks. The average number of hours per week was 1.6 less for unskilled railroad labor than for unskilled labor in manufacturing in the first quarter of this year, whereas, in 1914 the average working week of unskilled railroad labor was 5.8 hours longer than that of unskilled manufacturing workers.

Telegraph Men Hold Convention at Quebec

Maintenance Instructions, Increased Message Traffic and Interesting New Developments Discussed

THE TELEGRAPH AND TELEPHONE section of the American Railway Association held its annual convention at the Chateau Frontenac, Quebec, Que., on September 9, 10 and 11. Chairman I. C. Forshee (Penn.) presided. The program included the reports of 10 regular committees, eight subcommittees and five papers by technical representatives of the manufacturers and telegraph companies. The total attendance was about 260.

The Section was welcomed to Quebec by Mayor Joseph Samson who spoke both in French and in English.

Reports on Plant Construction and Maintenance

A complete set of detailed instructions for the maintenance of outside telegraph and telephone plants was submitted for discussion. These rules stipulate the action to be taken, in ordinary maintenance, and also in case of line breaks, storms, etc. Standards for the splicing of lead cables are necessary and the new instructions on this subject, as presented by the committee, established a high standard of workmanship.

Line failures are often caused by inferior grades of line or tie wires. In order to establish certain tests of such materials a new specification for both copper and galvanized iron line and tie wires has now been completed. The construction of safety belts and straps has heretofore been left to the individual manufacturers. However, the new specifications for leather body belts and safety straps, which were presented by the committee, establish requirements for a 2 in. strap 3/16 in. thick with drop forged buckles, snaps and rings.

Committee II—Inside Plant, submitted specifications for lead-sheathed office cable, in which special provision was made for the insulation of the wires for quad circuits with silk or cotton, the remainder to be cotton covered; No. 18 enameled wire being standard. Standards are established for the color marking scheme, sealing, insulation, resistance and electrostatic capacity. Specifications were submitted for metal boxes to be used as test, panel, terminal and protector cabinets. A specification for friction tape, which was presented, will assist in standardizing this product so that the users may secure uniform results.

The Sub-Committee on Circuits and Current Supply submitted an extensive report including 44 drawings and explanations of switchboard circuits and apparatus for wire chief equipment. Standardization of this apparatus reduces the time required for testing. A complete set of instructions for the maintenance of telephone apparatus, including selectors, forms an important part of this report; for these instructions give definite directions for maintenance and trouble location of telephone equipment.

A Study to Expedite Message Traffic

As a means of reducing the peak load traffic in relay offices the Committee on Message Traffic recommended the co-operation of the other departments in distributing the load throughout the day. Particular mention was made of the railways requiring operators to work eight straight hours without a lunch period, which, together with the ban on split tricks and the excessive cost to the railways for overtime, make it necessary to regulate the traffic file as much as possible.

Increased message capacity can be accomplished by securing the interested co-operation of message-using departments, dictation being given to more than one stenographer or typist when practicable, requiring the prompt transcribing and filing of messages in all cases, especially at the opening of the business day and after luncheon. The peak load can be relieved further by the use of concentration units. It is the sense of the committee that it is not advisable to use aeroplane mail service for the handling of telegraph traffic.

The automatic printing telegraph is practical for handling

light traffic loads on railway circuits and for inter-divisional message service. There are automatic printing telegraph devices now on the market suitable and available for such service. The substitution of telephone circuits for local message work, where conditions justify, is also recommended, as the installation of such circuits has proved to be economical.

In order to relieve the wire load the railway mail service or postal mail service (special delivery, if necessary), should be used in forwarding communications that will reach the addressee in time to accomplish the intended purpose. All communications to be offered for transmission by wire should be censored rigidly to reduce such as are necessary to transmit by wire to the fewest words that will insure comprehension. A censor should be designated in each originating office to scrutinize each wire communication before it is released. Figures should not be used in commercial messages, as each character is counted a word, *i.e.*, "30th" is charged as three words, while the written date "thirtieth" is charged as one word; likewise "13520" is charged as five words, while "thirteen five twenty" goes as three words.

The report of the Committee on Telegraph and Telephone Development included explanations of 26 new pieces of apparatus or interesting installations. A concentration cabinet used by the St. Louis-San Francisco and several other roads has accomplished noted savings in the reduction in the number of operators required and in increased facility in handling messages. The description of a new electrolytic rectifier using tantalum metal as an electrode especially adaptable to telegraph work, and the explanation of the use of loud-speaking telephone sets for way stations, formed interesting parts of this report.

Other committees which submitted reports of a strictly technical nature included those on Electrical Protection, Inductive Interference and Radio and Wire Carrier Systems, which were received by the convention with interest and discussed at length. At intervals between the submission of committee reports technical papers were presented to the convention as follows: "A. C. Mil-Ammeter Method of Testing Open Wires," by R. T. Davenport, plant supervisor, Postal Telegraph-Cable Company; "Machine Switching Private Branch Exchanges and Their Application to Railroad Service," by W. H. Harrison, central office engineer, American Telephone & Telegraph Company; "The Detection and Location of Trouble on Telephone and Telegraph Circuits," by H. S. Osborne, transmission engineer, American Telephone & Telegraph Company; "Prolonging the Life of Our Pole Line Timber," by P. J. Howe, construction engineer, Western Union Telegraph Company, and "Effects of Aurora Borealis on Communication Circuits and Means of Mitigation," by John B. Taylor, consulting engineer, General Electric Company.

Entertainments

On Tuesday the members were entertained at luncheon by the Canadian Pacific Railway on the steamship Empress of France which lay in Quebec harbor. On Tuesday evening there was an exhibition of pictures of scenery in the Canadian Rockies and a demonstration in first aid by the prize First Aid team of the Canadian National.

On Friday there was a trip by special train to the great bridge across the St. Lawrence.

The election of officers resulted in the choice of G. D. Hood (C. R. I. & P.) chairman and H. A. Shepard (N. Y. N. H. & H.) vice-chairman.

The Telegraph and Telephone Appliance Association met on Wednesday and elected as chairman E. V. Adams, railroad sales engineer of the Western Electric Company; vice-chairman, W. L. Cook, Reliance Electric Company; secretary-treasurer, G. A. Nelson, Waterbury Battery Company, New York City.

Report on Collision at Linworth, Ohio

THE INTERSTATE COMMERCE COMMISSION has issued a report, dated August 8 and signed by W. P. Borland, director of the Bureau of Safety, on a rear collision, on the Hocking Valley, near Linworth, Ohio, on June 24, about 4:15 a.m., in a dense fog, when a southbound wrecking train, while moving at about three miles an hour preparatory to stopping for water, was run into at the rear by a following extra freight train (138) consisting of a locomotive and 39 loads of ore. The caboose of the leading train was wrecked. A brakeman on that train was killed.

The freight (and also the wrecking train) had been admitted to this (manual) block signal section under a caution indication. After quoting the rule, which, in a case of this kind, holds the engineman responsible for the collision, and at the same says that the leading train will be held strictly responsible for flagging, the report concludes:

Inadequate Protection

"The primary cause of this accident was the failure of the conductor and the flagman of extra 255 (the wrecking train) properly to protect their train and the failure of the engineman of extra 138 to operate his train under proper control after having received a caution block signal indication. The underlying cause was lax operating practices, and rules which were inadequate to provide for the safe operation of trains under the conditions existing at the time of this accident.

"The investigation disclosed that Conductor Lafferty and Flagman Bennett of extra 255 took no measures whatever for the protection of their train as its speed was reduced preparatory to stopping for water at the point of accident. Conductor Lafferty had previously been advised of the intention of the engineman to stop for water at this point, and because of the dense fog both he and the flagman should have been particularly diligent in providing necessary flag protection. Had they dropped off lighted fusees approaching this point, the accident would probably have been averted.

Absolute Block Recommended in Foggy Weather

"Although Engineman Stein of extra 138 said he proceeded slowly through the block, it appears according to his own statement that the speed of his train for part of the distance exceeded 12 miles an hour and at the time of accident was 8 or 9 miles an hour. In view of the dense fog which limited the range of vision to a distance of three or four car-lengths, it is evident that he did not operate his train under control as required by the caution block signal indication and the special time-table rule quoted above; had he done so he would probably have been able to stop in time to prevent the accident.

"While the manual block system was nominally in effect on this line, the investigation disclosed that in this instance five trains were admitted to the block in succession, extra 255 being preceded by three helper engines. Under these circumstances it is apparent that no protection whatever was afforded by the so-called block system. Rule 91 (a) provides that operators shall space passing trains 5 minutes apart during clear weather and 10 minutes apart during foggy or stormy weather. This appears to be the only precaution expressly provided by the rules for additional protection when view is obscured by weather conditions. *It is a dangerous practice to allow trains to enter an occupied block at short intervals of time when the view is obscured by fog, storm or otherwise. Under the weather conditions which existed at the time of this accident, in order properly to safeguard train movements an absolute block for all trains should have been placed in effect.* * * *"

Joint Fact Finding Committee for Clerical Forces, Pennsylvania Railroad System. Left to right: W. W. Moore, supervisor, Labor and Wage Bureau, Southern General Division; E. N. Crumbling, chairman, general superintendent's department, Central Pennsylvania Division; J. F. Good, supervisor, Labor and Wage Bureau, Eastern Pennsylvania General Division; I. G. Fell, regional chairman, Clerical Employes; S. T. McDowell, general chairman, general superintendents' departments; W. A. Baird, examiner, Wage Bureau, assistant general manager's office.

Practical Method of Securing Co-operation*

How the Pennsylvania Railroad Has Applied Constructive Measures—The Results

By a Pennsylvania Representative

CO-OPERATION BETWEEN MANAGEMENT AND EMPLOYEES to promote efficiency is one of the chief aims of all modern industrial organizations. Where means of bringing it about have not been born of human considerations, competition or enlightened selfishness has dictated its necessity. At any rate it is at least desirable and in most instances an absolute essential. The railroads may be included in the latter class.

In the railroad industry transportation charges—the price received—and wages and a great part of other operating expenses comprising production costs are beyond managerial control. The margin out of which management is expected to produce satisfactory net results is relatively small. Success to any appreciable degree depends in no small measure upon ability not only to avoid and prevent waste but also to find and utilize every possible means and opportunity to increase the efficiency of the whole transportation machine.

More so perhaps than in any other industry the personnel of the railroad organization offers a broad and fertile field for development of this policy and realization of tangible results. Employees of a large system are scattered over a wide territory. Constant supervision is impracticable. To a very considerable extent employees have it in their own power in the performance of their routine daily duties to turn profits into deficits and to make successful and satisfactory operation almost an impossibility.

Competition between railroads, under the present system of governmental regulation of the industry, is largely one of service. In the final analysis service may be reduced to terms of the employee's attitude toward his job, his company, and the public. In includes innumerable factors, each one apparently insignificant and inconsequential in itself but large and influential in the aggregate. Service of the competitive variety extends no less to the repairman in the roundhouse, the car inspector at a terminal, and the section man on the track, than to the engineman in the cab and the conductor whose "Thank you" as he takes your ticket makes you feel like a guest of the company, not merely a passenger.

Efficiency of operation is the sum total of these and many other factors too numerous to mention. To marshal them all effectively, to impart to the whole system a smooth-running impetus and the enthusiasm of team-play becomes a matter of morale more than a matter of rules and regulations. The desired result can be achieved only through co-operation among those who comprise the organization.

Best Method of Bringing About Co-operation

What then is the "best" method of bringing about co-operation?

The answer, if there is one at the present time, would not have to wait for admittance at the door of many railroad executives in the United States. The search for it is still on. It is engaging the thought of practical operating men as well as of students of industrial relations, and it is reasonable to suppose that what might be "best" for one railroad would not fit another. In other words, experience thus far is not such as to permit of a sorting and classifying and weighing of methods to determine with finality which one may properly be considered the best.

On the other hand, sufficient progress in the study and development of co-operative methods has been made to justify

*This is one of the articles entered in the *Railway Age* competition on co-operation. The story about the competition appeared in the *Railway Age* of June 21, 1924, page 1755. The first prize article was printed in the *Railway Age* of June 28, 1924, page 1805, and the second prize article in the *Railway Age* of July 12, 1924, page 51. Other articles entered in the competition, or which was based upon the competition, will be found in the *Railway Age* of July 26, 1924, page 153; August 9, page 235; August 23, page 323, and September 6, page 411.

the presentation of a plan, which has satisfied probably the most exacting test that could be applied to it. It has been in successful operation during three of the most trying years in railroad history—one of them a year of record traffic—on a railroad which performs more than 10 per cent of the country's transportation service and employs more men than any other railroad in the world.

The method referred to is in effect on the Pennsylvania Railroad System. In a general way its principal features are well-known, although in some quarters the purpose of the plan, its operation and success have been subject to no little misrepresentation and misunderstanding. In the present instance, it will be necessary to review only its fundamental principles and modus operandi. At the same time, however, it is intended to apply to it practical tests of a character to indicate its title to consideration as one of the "best methods for bringing about co-operation between railways and their employees to promote efficiency."

Causes for Lack of Co-operation

It may be accepted as a fact that lack of co-operation and, therefore, inefficiency, is due more to discontent and dissatisfaction among employees than to any other cause. Whether founded on actual or fancied grievances, inspired or spontaneous, is beside the point. The problem is to remove the cause. It is likewise a fact that fundamentally the cause is lack of knowledge of the facts, or suspicion that the facts are not what they are represented to be, or both.

Modern labor policy recognizes that employees in industry have certain essential rights: 1, steady employment; 2, at a good wage; 3, time for recreation; 4, opportunity for advancement; 5, a voice in determining the rules and regulations under which one should work; and 6, a fair division of profits after a reasonable wage has been earned and a sufficient amount paid to capital to attract it to an expanding business.

Granting these, it is only the visionary who thinks that labor seeks responsibility of management or representation on the directorate. As a matter of fact under employee participation in management on the Pennsylvania, a decision affecting mutual interests jointly arrived at by employees' and management representatives is beyond any higher veto power.

Basic Principles of Pennsylvania Plan

Consider then the basic principles underlying the Pennsylvania plan of employee-management relationship. There are three:

1. Faith in each other.
2. Facts jointly established.
3. Fair play.

Reduced to simple terms, the Pennsylvania Railroad labor policy is simply the old-fashioned method of sitting down around a table as friends and partners in a common enterprise and talking over the facts of a situation for the purpose of reaching a common understanding.

It proceeds on the theory that men are fair and reasonable when they know the facts; that employees and management have an equally vital stake in the railroad; that their individual success is determined by the success of their joint enterprise; and that negotiations and agreements arrived at from the bottom up and not handed down from the top or from the outside are conducive to mutual understanding and satisfaction.

What is the practical means of carrying out this policy?

Briefly the fundamentals of the Pennsylvania method are these:

1. An opportunity for all employees to have a voice in the management in matters in which they are directly concerned (wages, working conditions, etc.) through employee representatives elected by themselves regardless of whether they are union or non-union members.

2. Establishment of a mutually satisfactory method of promptly settling all controversial questions arising between management and men.

3. Establishment of a joint tribunal for each class of employees equally representative of employees and management, which is the final arbiter in the disposition of industrial disputes.

It is recognized of course, that an employee has a right to join or not to join any organization, but membership or non-membership in any organization does not concern the management. The primary requisite is that the employees and the management deal directly with each other, that spokesmen for the employees be employees themselves, chosen by the employees, speaking and acting for the employees and not taking orders from or acting for persons or organizations outside the Pennsylvania System who have interests to serve other than those of the railroad, its employees and the public.

Such a basis is fundamentally sound. It is of paramount importance in the interest of the public—which requires adequate, efficient, economical and uninterrupted transportation service—by reason of the fact that the sympathetic strike, the closed shop and restriction of output are countenanced and practiced by certain organizations which during the period of federal control very largely extended their membership among railroad employees.

Collective Bargaining Recognized

On the other hand, it should be clearly understood that the Pennsylvania plan is not anti-union. The fact is that in several branches of the service, namely, engine and train service, signalmen and telegraphers, the company is dealing with committees of employees, all of whom are union members. Furthermore, not only does the Pennsylvania plan recognize collective bargaining, but it is based primarily on that very principle. Collective bargaining means dealing through chosen representatives instead of individually with each employee.

How the Plan Operates

In operation the plan is this: Committees of employee representatives meet regularly with local officers, division and general superintendents and general managers. Dates of meeting are specified and delays due to evasion are impossible. If questions brought up locally are not settled locally they may be taken on up through the higher officers to the general manager, five days' notice in advance being given by either party of a subject to be discussed. If not settled in the meeting with the general manager, the highest operating officer, they go to a joint committee.

The latter is the keystone of the plan—a joint reviewing committee for each class of employees, equally representative of employees and management—a committee in which all members have equal voting power and two-thirds vote is necessary to decide any question. If the committee itself is unable to settle the issue raised, it determines how the issue shall be settled by reference to arbitration or other means.

All meetings from the bottom to the top are consecutive and spaced in point of time so that a disagreement between the local committee and a superintendent can be referred to the general superintendent, allowing the necessary five days, and in case of disagreement there, to the general manager, with the necessary five days' notice, and finally, if necessary to the joint reviewing committee—all within a short cycle of time, not exceeding 60 days. Ordinarily the time is reduced to about 30 days. In the case of matters involving an interpretation of working agreements, the procedure is quickened by direct reference, in the event of local disagreement, to the joint committee for interpretation.

Naturally there are a great many regulations governing the procedure outlined, but it is not considered necessary to go into details here. It may be stated, however, that the three principles already mentioned apply to the formulation as well as the negotiation and execution of these regulations. Having worked out jointly the method of conducting elections, the elections themselves are conducted almost wholly by employees, the management giving only such assistance and advice as is requested. Influence, intimation or intimidation on the part of the management are impossible under the Pennsylvania plan.

From the Employees' Viewpoint

How may this plan be tested as a method of bringing about co-operation between management and employees to promote efficiency? Consider it from three viewpoints, the importance of which will scarcely be questioned.

First—As regards the employees themselves.

(a) It gives the individual employee, regardless of his membership or non-membership in any organization, an equal voice with his fellow-employees in choosing representatives to deal with the management on all questions affecting his interests. Through regular secret elections, it gives him a real opportunity to voice his desires and make certain that his representatives really represent him.

(b) It insures prompt, orderly hearing and adjustment of grievances.

(c) Through democratically elected representatives, it gives the employees an equal voice with that of the management in deciding matters in which they are directly interested.

(d) In some instances it has secured for the employees better wages and working conditions than employees on other railroads.

(e) It has the wholehearted support of the vast majority of the employees, the various elections showing actual participation in the voting of from 75 to 90 per cent of the employees concerned, the percentage of void ballots in all elections being only about 5 per cent of the total number eligible to vote. This is a far higher percentage of eligible voters participating in an election than is true of state, municipal and other elections.

(f) Through the system of appeals provided for and the consequent check by higher authority and finally by the joint reviewing committees, on decisions of local officers, it insures to the employee more careful and sympathetic consideration of individual grievances.

(g) Finally, it is a working success as shown by the records of cases handled through the employee representation plan.

During the year 1923, 13,485 cases were taken up with individual officers from those below the grade of superintendent on up to the general manager. Of this number 6,279 or 46.4 per cent of the total, were adjusted or compromised in favor of the employees in conferences without appeal. Appeals were taken in 3,341 cases, or 24.8 per cent of the cases handled. In 3,865 cases, or 28.6 per cent of the total, the matter was withdrawn as having no merit or for other reasons.

In less than one per cent of the cases taken up on behalf of the employees was it necessary to take appeals to the reviewing committees, a mutually satisfactory settlement having been reached with the local officials or next higher authorities. The actual number received by the reviewing committees in the year was 149. Of this number 65 were decided in favor of the management, 37 in favor of the employees, and 47 were withdrawn or remanded after reaching the committees.

From the Standpoint of the Public

Second—As regards the public.

(a) The Pennsylvania plan offers practical assurance of uninterrupted transportation. No more conclusive evidence on this point could be offered than the performance of the Pennsylvania Railroad System during the shopcrafts strike of 1922. Operating under the employee representation plan, with wages and working conditions negotiated by the management and employee representatives, two-thirds of the Pennsylvania shopmen remained at work in the face of a national strike and enabled the company to carry not only its own share of the country's traffic but a large part of that of its neighboring railroads whose service was more seriously affected than that of the Pennsylvania.

(b) By establishing a mutually satisfactory understanding and working basis between management and employees, the public is assured of service by a more contented body of employees, a condition which cannot help but be reflected in courteous, efficient, thoughtful service.

From the Company Standpoint

Third—As regards the company. (Benefits which are also reflected in improving the company's service to the public.)

(a) The Pennsylvania plan has enabled the company to negotiate and agree with its employees on the most important questions affecting their mutual relationship—wages and working conditions—without recourse to outside agencies. Among all classes of employees during the three years of successful operation of the plan, only three matters have been referred to the joint committees which failed to be decided by those tribunals in regular procedure. In one case the matter was settled by arbitration, by arbitrators selected by the committee, and in the two other cases the matters were placed in the hands of a sub-committee for special investigation and recommendation. Upon the findings of these sub-committees the cases were decided.

(b) The company has been enabled to establish a spirit of mutual confidence between officers and employees to such an extent that heretofore unprecedented procedure has been adopted in the disposition of difficult questions. The recent wage demands of the train service employees were settled on the basis of facts gathered by a joint fact-finding committee equally representative of employees and management. In several regions joint committees have been appointed equally representative of management and employees to study and report upon such matters as whether piece-work or day work should be the rule in roundhouses and upon improvements in the roundhouses themselves to increase productive efficiency.

(c) The spirit of co-operation growing throughout the System has taken form in many ways; for instance: Representatives of the employees in certain sections have taken upon themselves an active solicitation of business for the company. Representatives of the employees have organized campaigns to reduce loss and damage to freight and to increase efficiency at freight transfer stations.

(d) Interest has grown in the securities of the company on the part of employees, and purchase of stock by employees has considerably increased.

(e) Some idea of the improvement effected by the company in the three years during which the plan has been in operation is shown by the following statistics: Rate of return on investment increased from 1.88 per cent in 1921 to 4.07 per cent in 1923. Revenue ton-miles (the measure of freight service) increased from 34,456,000,000 in 1921 to 48,623,000,000 in 1923. Passenger miles (the measure of passenger service) increased from 5,164,000,000 in 1921 to 5,206,000,000 in 1923. In handling this increase of more than 40 per cent in business, the average number of employees per month in 1923 was an increase of only 17 per cent over 1921. Serviceable locomotive equipment increased from 87.1 per cent at the end of 1921 to 91.1 per cent at the end of 1923. Serviceable freight cars increased from 88.1 per cent at the end of 1921 to 92.9 per cent at the end of 1923.

In this connection, a well-known financial writer in the

New York *Sun*, who styles himself "a constant reader of Pennsylvania Railroad annual reports for 30 years," commented as follows on the showing made by the railroad in 1923, as indicated in the annual report recently made public: "The company's officers are to be congratulated upon having extricated the property from the 'mess' into which the Railroad Administration plunged it as a result of the war."

* * *

It would be rash to say that the Pennsylvania officers and employees regard their accomplishment in the last three years as a finished job or a final solution of the industrial relations problem. On the other hand, there is ample justification for their belief that they have found a practical, mutually satisfactory and actually successful basis of co-operation between management and employees, which has already produced substantial results and promises increasing benefits to the employees, the company and the public.

R. A. O. A. Committee Appointments

THE RAILWAY ACCOUNTING OFFICERS' ASSOCIATION has announced appointments of the chairmen and new members of its several standing committees. The committee chairman serves for one year only. In the case of the Committee on General Accounts, consisting of 25 members, the members serve a five-year term, in other words, five new members are appointed each year. In the case of the other important committees, the term is three years, one-third of the committee retiring each year. The president of the association, who serves also as chairman of the executive committee, is E. M. Thomas, comptroller of the Chesapeake & Ohio.

The new appointments are as follows:

COMMITTEE ON GENERAL ACCOUNTS

Chairman: W. C. Wishart, comptroller, New York Central Lines.

For terms expiring in 1929: G. E. Bissonnet, gen. aud., Union Pacific; A. J. County, vice-pres., Penn. System; J. J. Ekin, compt., B. & O.; W. E. Eppler, compt., D. & H.; L. R. Powell, Jr., vice-pres. and compt., S. A. L.

COMMITTEE ON FREIGHT ACCOUNTS

Chairman: J. P. O'Malley, asst. compt., B. & O.

For terms expiring in 1927: E. J. Bloodgood, asst. gen. aud., C. & N. Y.; H. B. Cutter, aud. frt. accts., L. & N.; H. L. Fulton, aud. traf., C. of Ga.; W. B. Kraft, aud. rev., Penn. Sys.; J. P. O'Malley, asst. compt., B. & O.; S. L. Porter, aud. frt. accts., C. B. & Q.; C. F. Taylor, aud. frt. traf., C. & O.

COMMITTEE ON PASSENGER ACCOUNTS

Chairman: E. J. Johnson, aud., N. P.

For terms expiring in 1927: G. S. Cooper, aud. tkt. accts., C. B. & Q.; A. R. Down, aud. pass. rects., N. Y., N. H. & H.; S. L. Hamilton, aud. pass. accts., N. Y., C. & St. L.; H. H. McIntyre, aud. pass. rects., Mo. Pac.; S. C. Nichols, tkt. aud., A. T. & S. F.; J. C. Starkey, aud. pass. accts., St. L.-S. F.; C. G. Weaver, aud. pass. traf., C. R. I. & P.

COMMITTEE ON DISBURSEMENT ACCOUNTS

Chairman: J. C. Wallace, gen. aud., C. C. C. & St. L.

For terms expiring in 1927: J. F. Dartt, aud. disbts., Ill. Cen.; I. V. Jessee, aud. disbts., N. & W.; J. Kennedy, aud. disbt. accts., S. P.; A. W. Martenstein, aud. disbts., C. & O.; F. D. Pollard, aud. disbts., S. R.; G. B. Reeves, aud. disbts., L. & N.; J. C. Wallace, gen. aud., C. C. C. & St. L.

To fill term expiring 1925: W. H. Elmendorf, aud. disbts., N. Y., C. & St. L.

COMMITTEE ON R. A. O. A. OVERCHARGE AND AGENCY RELIEF CLAIM RULES

Chairman: J. W. White, aud. frt. accounts, O. W. R. & N.

For terms expiring in 1927: R. M. Hunter, aud. O/C clms., C. & O.; E. Laughton, aud. of traf., L. V.; J. F. Schutte, aud. frt. clms., B. & O.

COMMITTEE ON TERMINAL COMPANIES' ACCOUNTS

Chairman: Geo. Mitchell, Manufacturer's Junction Ry.

For terms expiring in 1927: I. G. Douglas, compt., E. J. R. R. & T. Co.; O. J. Rider, gen. acct., B. & O.; R. O. Ripley, aud., K. C. T.

COMMITTEE ON VALUATION ACCOUNTING

Chairman: F. C. Sharwood, asst. gen. aud., N. P.

For terms expiring in 1927: Geo. H. Hess, Jr., compt., G. N.; W. D. Owens, asst. compt., B. & O.; J. S. Tassin, aud. of val., So. Ry.

COMMITTEE ON STATISTICS

Chairman: A. L. Conrad, asst. gen. aud., A. T. & S. F.

For terms expiring in 1927: H. D. Chamberlain, aud., D. & H.; F. J. Fell, Jr., asst. compt., Penn. Sys.; J. M. Rodgers, gen. aud., N. & W.

Committee chairmen of the other committees of the association have been appointed as follows:

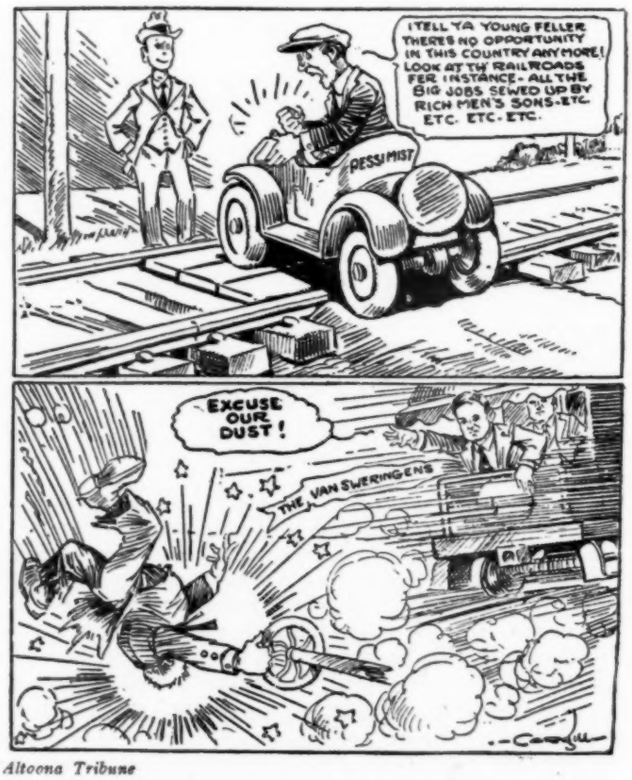
Committee for Conference with Railway Treasury Officers' Association, J. W. Newell, comptroller, Wabash.

Committee for Conference with Division V, Mechanical, American Railway Association, J. C. McKalip, gen. aud., Bessemer & Lake Erie.

Committee for Conference with the American Association of Passenger Traffic Officers, W. A. Meglemry, aud. pass. accts., Louisville & Nashville.

Committee to Attend Convention of the National Association of Railroad and Public Utility Commissioners, C. A. Lutz, vice-pres., American Railway Express Co.

HENRY SHEARER, general manager of the Michigan Central, in a letter to the Public Service Commission of Indiana, has suggested a law requiring all motorists to stop before driving over railroad grade crossings. The letter is a reply to an invitation to attend a safety conference called by Governor Branch at Indianapolis for October 14. The Railroad Commission of Indiana has sent letters to leading church organizations asking them to observe September 14 as safety Sunday.


I TELL YA YOUNG FELLER THERE'S NO OPPORTUNITY IN THIS COUNTRY ANYMORE! LOOK AT TH' RAILROADS FER INSTANCE - ALL THE BIG JOBS SEWED UP BY RICH MEN'S SONS - ETC. ETC. ETC. ETC.
PESSIMIST
EXCUSE OUR DUST!
THE VAN SWERINGENS

Altoona Tribune

Another Terrible Accident at the Railroad Crossing

Hearing on Southern Pacific-E. P. & S.W. Merger

Total Annual Savings Through Unification Estimated at $3,430,950—New Lines and New Service Planned

THROUGH ACQUISITION of the El Paso & Southwestern System by the Southern Pacific Company, together with the railroad construction in Arizona proposed by the Southern Pacific, the public will be better served, more efficient and economical operation provided and new territory opened up for development at less expenditure than by any other development of railroad facilities in the states affected that could possibly be made.

This was the statement by Julius Kruttschnitt, chairman of the executive committee of the Southern Pacific, at the hearing on the joint application of the two railroads for acquisition of control of the E. P. & S. W. by the Southern Pacific, before Charles D. Mahaffie, director of finance of the Interstate Commerce Commission on September 8.

Mr. Kruttschnitt estimated that total annual savings amounting to $3,430,950 would result from unification of the properties of the railroads and elimination of capital expenditures by the Southern Pacific that would otherwise be needed to care for its increasing traffic.

"It is a logical union," said Mr. Kruttschnitt, "as demonstrated by the complementary nature of the properties to be united and by the fact that their consolidation has been proposed in every comprehensive consolidation plan that has been put forward under the Transportation Act. Their unified control and operation will bring about an orderly development of transportation facilities in the country served, at the minimum of capital expenditure for new construction. The proposed acquisition will preserve existing routes and channels of trade and will result in improved efficiency and added competitive strength in the operation of the El Paso route in competition with the routes of the Santa Fe and Union Pacific between the Middle West and Southern California, to the advantage of the public. It will result in more efficient operation, in large operating economies, and in the avoidance of capital expenditures for new construction to the mutual advantage of the applicants and the public."

Mr. Kruttschnitt pointed out that acquisition of the E. P. & S. W. lines will afford a double track service between Tucson and El Paso.

Estimates of chief items of savings to accrue annually as a result of the proposed railroad unification include: Reduction in administrative expenses, $575,000; double tracking the Southern Pacific line between Tucson and El Paso which is rapidly becoming necessary to handle increasing traffic, including interest on the $16,830,000 such construction would cost, taxes on same and maintenance, a total of $1,943,100; economies through reduction of "unbalanced traffic" and use of Southern Pacific's 2-10-2 locomotives which are peculiarly adapted for use on E. P. & S. W. lines, $662,100; reduction in passenger train miles through unified service, $155,000.

Mr. Kruttschnitt showed further that the consolidation would facilitate movement of traffic, simplify dealings with the public and state and federal authorities, eliminate duplication of facilities, save money through purchase of supplies and equipment, and through the pooling of equipment and supplies. He called attention also to the fact that delay would arrest development of both Southern Pacific and El Paso & Southern systems, and possibly result in duplication of facilities to the detriment of the public upon whom the burden would ultimately fall. "The price to be paid," Mr. Kruttschnitt noted, "does not add one dollar to the investment in or the value of railway property upon which the public is called upon to pay a return and therefore can have no bearing upon the rate-making value of these lines or upon the rates to be paid by the public." The witness said he regarded the acquisition of the E. P. & S. W. as essential for the logical rounding out of the Southern Pacific System and stated his firm conviction that "the value to Southern Pacific of the properties sought to be acquired is largely in excess of the par value of the stocks and bonds to be issued in exchange therefor."

"The consolidation is to be brought about by an exchange of securities through which the Southern Pacific will become owner of all the capital stock of the railway companies comprising the E. P. & S. W. system and of all their outstanding bonds, except bonds of the face value of $9,098,000 in the hands of the general public. In exchange for these stocks and bonds to be acquired, and for all other assets of the El Paso & Southwestern Company the Southern Pacific proposes to issue to the El Paso & Southwestern Company $28,000,000 par value of its common stock and $29,400,000 face value of its 5 per cent 20-year collateral trust bonds."

Construction Work Proposed

As to the construction work to be undertaken in Arizona by Southern Pacific, Mr. Kruttschnitt said: "The new line will leave Southern Pacific near Picacho, 43 miles west of Tucson, running northerly 50 miles to Chandler, on the Arizona Eastern (a Southern Pacific subsidiary), with a branch of 7 miles to shorten the haul from Magma and points east thereof. From Chandler the existing Arizona Eastern will be improved for a distance of 63 miles through Phoenix to Hassayampa, whence a new line of 115 miles will join the existing main line of Southern Pacific at Dome. The total new construction will be 165 miles; road to be improved, 63 miles; total 228 miles; also 7 miles of branch to Florence. The estimated cost is $12,752,000 for new construction; $1,386,000 for improving existing line; total $14,138,000.

Mr. Kruttschnitt showed that "the linking of the main line of Southern Pacific with Arizona Eastern at Chandler will provide a short route to that territory, while extension westward from Hassayampa to Southern Pacific main line will in connection with other construction, provide a main line through Phoenix and the Salt River Valley but little longer than the present line. Incidentally the distance from the Gila River Valley to Tucson and points east will be shortened and the distance from Phoenix to southern California likewise shortened. Tucson and Phoenix will be connected with convenient main line service." Although the new line via Phoenix will be 40 miles longer than the present Southern Pacific main line it possesses marked advantages in the way of lower grades.

"The cost of constructing the new line," Mr. Kruttschnitt said, "will be offset by savings gained by eliminating local train service that will become unnecessary, by short-routing traffic to and from the mines near Magma and east thereof, and between Phoenix and Southern California, and most of all by avoiding double tracking the main line of Southern Pacific now imminent."

The witness showed that the expense of double tracking the section of Southern Pacific line westward from Picacho, rapidly becoming necessary because of the increasing volume

of traffic, would be obviated as a result of the new construction which would afford double track service there. From the new construction, the public would not only benefit through the saving of this expense but also from the new development made possible and from operating economies.

Comprehensive Statement by L. J. Spence

L. J. Spence, director of traffic of the Southern Pacific, presented a comprehensive statement, supplemented by maps and charts, showing that movement of freight and passenger traffic would be expedited and made more economical if the El Paso & Southwestern lines are joined with those of the Southern Pacific. Such acquisition of the E. P. & S. W., together with the railroad construction in Arizona proposed by the Southern Pacific, Mr. Spence pointed out, will provide a second track substantially all of the way from El Paso to Yuma. This will give relief from frequent meeting of trains and consequent congestion on the single track line and will be "of incalculable benefit to the through freight and passenger service."

"Together with the unification of separate units," Mr. Spence continued, "this will enormously contribute to the strength of the El Paso route in competition with the Santa Fe route, which will soon have two tracks all the way between Chicago and Southern California, and with the Union Pacific, of which a large part is double track route. These improvements, coupled with the increased production and consumption of the territory to be served and developed by the proposed construction through Arizona, may be expected to substantially expand the volume of freight and the share of passenger travel via the El Paso route, and thereby stimulate the prosperity of all of the communities located thereon and the sections of the country tributary thereto."

The witness showed that "the elimination of the E. P. & S. W. as a separate operating unit will facilitate the making of rates, as well as the arrangement and maintenance of passenger train schedules, will promote flexibility of service and the conduct of business with the shipping and traveling public, and will simplify relations with public authorities."

Referring to the territory west of El Paso where the E. P. & S. W. line parallels that of the Southern Pacific as far as Tucson, Ariz., Mr. Spence showed that the entire tonnage during the year 1923 between all points, including El Paso, reached by both lines was only 3,062 tons by the E. P. & S. W. and only 8,427 tons by the Southern Pacific.

Mr. Spence submitted a statement showing the interchange of revenue freight tonnage between the El Paso & Southwestern and connecting lines during 1923 as follows: With the New Mexico Central, 1,329 tons; Texas & Pacific, 11,011 tons; Mexican lines at El Paso, 53,339 tons; Santa Fe, 155,777 tons; Rock Island, 1,555,857, and Southern Pacific, 1,616,888 tons.

"It is therefore apparent," he said, "first, that the interchange with the Southern Pacific lines exceeds the interchange with every other connection, and, secondly, that the interchange with the Southern Pacific lines and the Rock Island embraces all but a very minor portion of the whole interline freight traffic of the E. P. & S. W. system. None of this preponderant interchange will be disturbed by the unified operation of the E. P. & S. W. and Southern Pacific lines, nor will there be any material disturbance of the minor volume of interchange heretofore made with other connections. Therefore the proposed merger will maintain existing through routes and channels of trade and commerce to an extraordinary degree." The witness traced the development of traffic in perishable products from the Imperial Valley and elsewhere and showed how the unification of the two railroad systems would facilitate this movement.

"The Rock Island—E. P. & S. W.—Southern Pacific route is the only route by which the Southern Pacific can maintain the same passenger train schedules between Chicago and Los Angeles as maintained by the Santa Fe route and the Union Pacific route," Mr. Spence asserted. "It is the route of the Golden State Limited, which is operated daily in each direction between Chicago and Los Angeles upon a schedule of about 68 hours. It is the only route passing through El Paso by which through passenger trains are operated between Chicago or Kansas City and southern California.

"Beginning next winter this service will be increased and improved in character. The Golden State Limited will be composed entirely of new equipment consisting exclusively of Pullman cars, a through dining car, club car with smoking room, barber shop and bath and valet service, and a new type of observation sleeper containing ladies retiring room and bath with maid and manicure service. In addition to standard sleepers from Chicago, St. Louis and Minneapolis to Los Angeles, it will carry standard sleepers from Chicago to Santa Barbara and San Diego and will run on a schedule of 68 hours and 35 minutes westbound and 68 hours eastbound between Chicago and Los Angeles. The second through train now operated between Kansas City and Los Angeles will be continued with standard Pullman sleepers and coaches, and dining car attached at all meal hours, and will probably be extended to Chicago. A third train will be inaugurated which will carry standard sleepers and coaches between Chicago and Los Angeles and tourist sleepers between Minneapolis and Los Angeles and between Chicago and Los Angeles, with dining car attached at all meal hours.

"The best and most frequent passenger train service which has ever been maintained by the El Paso route will thus be provided to the great benefit of El Paso and all of the territory west thereof, not only by the direct use of this enlarged and improved service but by the results of the exploitation and the opportunities afforded through transcontinental passengers to visit all of the intermediate country, especially with the ten-day stop-over privilege which is granted on through tickets."

It is estimated that the new railroad construction will open for development 200,000 acres of land which may be brought under irrigation.

Sentiment of commercial interests of the entire Southwest is unanimously in favor of the proposed consolidation, according to representatives from Southwestern communities, including the public service commissions of Arizona and New Mexico, who testified in favor of the consolidation. When Director Mahaffie asked some of the witnesses whether they would favor the merger without the new construction, the reply was that both propositions had been considered together.

Ewing Galloway

Erie Railroad Caboose Which Was Loaned to Peary and Used by Him as Deckhouse in 1899

Better Terminals versus More Locomotives*

Locomotive Viewed as a Modern Power Plant on Wheels at the General Foremen's Convention

By L. G. Plant
Assistant to the President, National Boiler Washing Company, Chicago

THE DESIGN, OPERATION and maintenance of motive power should be governed so far as possible by four fundamental objectives: first, dependable design and reliable operation; second, efficiency in operating cost and capacity; third, maximum output of the most efficient motive power units; fourth, economy in the maintenance of locomotives in a dependable, efficient and productive condition.

Dependable power has always been regarded as the most vital requirement upon the motive power department. The consequences of a failure on the road are such that in locomotive construction and subsequent maintenance, operating reliability is the first consideration. No feature in design however efficient, nor maintenance practice however economical will ever be tolerated on American railroads if it impairs the ability of the locomotive to "get over the road." Those who have sought to improve motive power efficiency by the application of auxiliary devices have found that they must first provide equipment that can be depended upon to function reliably.

No saving in the cost of operating locomotive shops and terminals will justify engine failures resulting from too rigid economy in their maintenance. Nor can the time that locomotives are available for service be increased at the expense of time actually required for maintaining these locomotives in a dependable operating condition. Any permanent improvement in locomotive output must be based upon sound operating methods and better facilities for maintaining motive power in a servicable condition.

Next to reliability in locomotive operation comes efficiency. Locomotive efficiency implies more than a relation between output and the fuel consumed; it includes capacity, both in respect to the investment involved and the size and weight of the locomotive itself. Efficiency in locomotive design and condition is the next most important requirement upon the motive power department.

Operate Most Economical Units

Maximum efficiency in locomotive performance cannot be realized without obtaining the maximum output from individual locomotives. Locomotive operation should always be concentrated upon the most efficient units and the maximum output continually secured from these locomotives so that the less efficient units can be stored. This practice is an important cause contributing to the substantial reduction in unit operating costs that have been registered by a number of railroads in recent years.

Compare, for example, the situation on the Union Pacific in March, 1924, with January, 1920. The gross freight ton-mileage, excluding weight of locomotive and tender, was 1,629,127 in March, 1924, and 1,624,860 in January, 1920. slightly higher in March, 1924, but the volume of freight traffic or amount of work performed by motive power in this class of service is sufficiently similar to afford a good basis for comparison. In January, 1920, the Union Pacific had an average of 371 serviceable freight locomotives, of which only 5 were stored. In March, 1924, this road reported an average of 459 serviceable freight locomotives on line but 184 of these locomotives were stored. In other words, the Union Pacific produced practically the same ton-mileage in March, 1924, with an average of 275 locomotives in freight service that it produced in January four years ago with 365 locomotives in this service.

It is evident that the Union Pacific could not have effected this large increase in the output of each individual freight power unit without the acquisition of more powerful and efficient freight locomotives. But it is also significant that along with the addition of these new locomotives, the railroad has pursued a systematic policy of storing the less efficient locomotives so that the average productive time of each locomotive in freight service is practically as high as it was when the number of locomotives available for service was considerably less. The Union Pacific could not have achieved its present state of operating efficiency with all its new motive power in use had it also retained the less efficient locomotives in service and allowed the average output of all freight locomotives to decline.

Too Many Locomotives—Too Few Terminal Facilities

There is a fixed "overhead" expense attached to every locomotive that continues whether the locomotive is in operation or idle. This "overhead" expense increases or drops with a decrease or rise in the traffic volume and can only be controlled through a policy governing the purchase of locomotives. Where increases in freight traffic have been met by increasing the average output of the locomotives in this service instead of placing proportionally large orders for additional motive power to handle the business, this policy has reduced the "overhead" expense for each locomotive owned. Conversely, there is no greater incentive toward increasing the individual output of locomotives owned than an actual shortage of power and some of the best examples of what can actually be accomplished in the utilization of motive power are afforded by these railroads on which motive power purchases have been restricted as a matter of policy or financial necessity.

The president of a locomotive company was recently quoted as having stated that there were too many locomotives in this country. This has no serious bearing upon the business of the locomotive manufacturers which is primarily that of replacing worn out and inefficient units with modern motive power that will save more than enough in operating costs to absorb depreciation and pay interest on the investment. But this statement is literally substantiated by a study of the actual situation that clearly indicates a greater need generally for expenditures upon locomotive terminals and other facilities for increasing the earning power of existing locomotives than for the purchase of additional motive power.

The greatest obstacle to this policy lies in the relative difficulty of obtaining funds for improvements to mortgaged property in comparison with the ease with which money can be secured for the purchase of locomotives through the sale of equipment trust obligations. A solution to this difficulty is found in the rental of improved terminal facilities from contractors who are able to install and finance these improvements on this basis.

The problem of increasing the individual output of loco-

*A paper presented at the convention of the International Railway General Foremen's Association, held at Chicago, September 9 to 12, 1924.

motives has acquired added importance with recent increases in the cost of motive power. The modern locomotive can, in reality, be regarded as a seventy-five or one hundred thousand dollar power plant. What would we be obliged to pay for electric current in any city, if supplied by three separate power plants each operating an average of less than eight hours out of twenty-four? To make this parallel complete, let us assume that the fires under the stationary boilers are dumped after each run.

This is substantially the condition applying to the average locomotive, which can be considered a self-contained power plant on wheels. It is possible that if these three power plants were each "assigned" to an individual crew, that these men would take a greater personal interest in their "assigned" power plant, would cultivate more flower beds surrounding the building, keep the brass railings polished somewhat brighter and perhaps reduce the maintenance cost to some extent. But it is apparent that both the operating and investment expense of such an arrangement would increase the cost of electric current to a figure that would not be tolerated in any community.

The same economic laws that govern the cost of electric current generated in a stationary power plant also control the cost of tractive force at the draw-bar of the locomotive. But the conditions under which locomotives are operated make it impossible for them to maintain continuous service, at least without radical changes in design and vastly improved terminal facilities. The rack and wear of running over uneven roadbeds and the intense rates of evaporation in locomotive boilers necessitate withdrawal from service for periodic shoppings.

But with all the limitations under which locomotives are required to operate, an opportunity exists on nearly every railroad for deriving a higher return upon its investment in motive power by reducing the non-productive time of locomotives. This is the time that locomotives are not actually in operation on the road and is called non-productive because a road locomotive cannot earn any revenue for the railroad when it is standing at a terminal or in a shop. A portion of the time now spent in terminals and shops is unavoidable but a comparison of locomotive performance on various railroads shows such discrepancies in the average non-productive time of locomotives as to suggest that with the necessary facilities a considerable improvement in the utilization of locomotives could be effected by a number of railroads.

The American Railway Association now has a committee including both operating and mechanical department officials who have been appointed to deal with the problem of locomotive utilization. A sub-committee is already at work on a study of the situation on various railroads with respect to this problem. An analysis of the methods and facilities on these roads will point the way to a substantial reduction in the non-productive time of locomotives but the subject should always be viewed broadly. The analysis might otherwise become so detailed as to obscure the real issue.

Locomotive Output Both an Operating and Mechanical Problem

The question of which department is responsible for a terminal delay is not of such consequence as the magnitude of the delay itself. Attempts to register the proportion of terminal detention for which the operating and mechanical departments are separately responsible usually degenerate into a futile effort to see which department is most successful at "passing the buck." The important thing is to keep the most efficient power in operation as much of the time as possible and this is an objective in which both departments are jointly concerned.

There are a number of admirable methods for improving locomotive utilization which the work of the American Railway Association's Committee will emphasize. The most widely advertised practice is the recent extension of locomotive runs. The inauguration of "Main-Trackers" or the continuous operation of freight trains through congested terminals without changing locomotives has undoubtedly contributed to the relatively high percentage of time the freight locomotives are in service on the Baltimore & Ohio. Another railroad arbitrarily requires its division officials to store a certain number of serviceable locomotives as soon as the average locomotive mileage for the division falls below a standard value.

Locomotive terminal and shop facilities, however, are the determining factors in respect to locomotive utilization and any comprehensive analysis of this problem must take these facilities into account. The effect of maintenance facilities upon the earning power of locomotives is more evident in the design of terminals than in the equipment of large shops. Locomotive terminal facilities not only govern the length of time that locomotives must be held out of service between each run but, with adequate equipment for current running repair work at the terminal, the length of time between heavy repairs for which the locomotive must be sent to the general shop can be materially lengthened.

Efficiency and Output More Important Than Repair Costs

It has been contended that the cost of making repairs at a number of terminals is generally higher than if this same work were concentrated at a large shop. But if the time that locomotives are available for service can thus be increased, the value of their additional earning ability should be weighed against the higher repair costs involved in making repairs at terminals. Reliability and efficiency in operation are also factors which take precedence over the cost of repairs provided this is not excessive. It is reported that one railroad on which the locomotive performance is particularly good both from the standpoint of operating efficiency and the utilization of motive power, is systematically making running repairs to locomotives each month coincident with monthly boiler inspection and washout.

The necessity for better locomotive utilization will compel improved locomotive terminal facilities that are designed for turning locomotives more rapidly and equipped for reducing the time required for current maintenance and repairs to locomotives. The locomotive terminal should no longer be regarded as a mere shelter for locomotives at the end of the run, means for turning these locomotives and for supplying them with fuel, sand and water. By increasing the output of the most efficient locomotives, the terminal can contribute indirectly, but none the less effectively to locomotive efficiency. There is also a direct economy resulting from improved terminal facilities and some types of terminal equipment can be classed as direct fuel savers, comparable in their effect to any of the numerous economy devices now being applied to locomotives. But in contrast with locomotive appliances, terminal equipment tends to reduce rather than increase locomotive maintenance costs.

No single terminal device has a more direct effect upon locomotive utilization or has greater possibilities for improving the efficiency and capacity of locomotive operation than equipment for washing and refilling locomotive boilers with hot water together with a recent development of this system which provides for steaming up locomotives by the direct injection of steam and hot water. This will enable large locomotives to be filled and steamed up in approximately half an hour and also makes it possible to generate a working steam pressure before the fire is lighted.

Economy in the maintenance of locomotives has been referred to as the fourth objective although it is generally regarded as the first and most definite requirement upon the motive power department. In fact, the mechanical organiza-

tion is often controlled entirely from a cost standpoint. This would not be so objectionable if a more logical unit than locomotive miles were applied to maintenance costs.

Ten years ago, it is recalled that only one railroad in the southeast and but few roads in other parts of the country computed fuel consumption upon a gross ton-mile basis in freight service. Fuel was then recorded upon a train-mile basis without regard to whether the figures applied to a 3,000-ton main line freight or a branch line local. All railroads now report fuel used in freight service upon a gross ton-mile basis and passenger fuel consumption upon a car-mile basis. But the statisticians still persist in basing maintenance costs upon the locomotive mile without regard to whether the costs apply to an eight-wheel "Tea-Kettle" on a regular branch line run or to a modern Mikado in a main-line pool. Unlike other necessary improvements, intelligent accounting does not require a large expenditure. True economy in locomotive maintenance cannot be achieved until the expenditures for this purpose are judged by a proper standard.

Atmospheric Conditions in Railroad Tunnels*

An Investigation on the C. & O. of Temperatures and Humidity of Gases in Locomotive Cabs

By S. H. Katz† and E. G. Meiter‡

RAILROAD locomotives produce heat, gas, and smoke, which cause considerable discomfort to enginemen and firemen while passing through tunnels. In order to try and improve these conditions, the Bureau of Mines has investigated the composition of atmospheres in cabs of freight locomotives while in tunnels; and some of the higher temperatures in the cabs were noted; physiological effects upon men were determined and gas masks and respirators were devised to eliminate the effects of irritating and poisonous gases and smoke.

These investigations were conducted in tunnels of the Baltimore & Ohio, Pennsylvania, and Union Pacific; while that described in this paper was carried out in tunnels of the Chesapeake & Ohio, situated in the Blue Ridge and Allegheny Mountains in Virginia and West Virginia.

The tendency in train operation has always been to increase the burden upon locomotives. Present traffic needs frequently load even the Mallet to capacity, and yet the weight of trains tends to increase. It has been suggested as a means of securing greater power units that Mallets be constructed to operate only as simple engines. This would increase the amount of steam given off as well as the amount of coal burned and the resulting volume of flue gas emitted.

Heretofore the high temperatures in cabs were attributed principally to exhaust gases and steam, and in the present tests especial effort was made to determine the temperatures at different positions in the cab and the relative effect of the exhaust gases and heat of the boiler in causing discomfort. It was found that stack gases entering the cab cause only a little increase in temperature; the increased humidity is principally due to steam carried in the stack gases; the exposed parts of the boiler, however, play an important part in raising the temperature in the cab.

Efforts were made to increase the comfort of the engine crew by blowing cool and smoke-free air upon them by means of specially installed blowers from a point 24 in. above the center of the rails between the locomotive and tender, as shown in Fig. 1. The enginemen and firemen found this air better to breathe, and their feeling of comfort was increased somewhat thereby. Turbulence produced by the incoming streams caused the air in the cab to impinge upon the boiler and become heated, so that outside of the direct line of the air streams little cooling was felt, and sometimes the discomfort seemed to increase.

*An abstract of a report issued by Department of the Interior, Bureau of Mines, Washington, D. C.

†Associate physical chemist, in charge of industrial gas laboratory, Pittsburgh Experiment Station, Bureau of Mines.

‡Assistant chemist, Pittsburgh Experiment Station, Bureau of Mines.

Ventilating Fans for Locomotive Cabs

On account of the high temperature, smoke and irritating gases which cause the difficult breathing experienced by crews of freight trains in tunnels, Geo. W. Bebout, electrical engineer for the C. & O. proposed blowers or fans for ventilating cabs with pure cool air drawn from a position low in the tunnels. A trial installation was built on Mallet locomotive No. 840 by J. J. Ewing, engineer of tests. Fig. 1 shows details of the steam turbine, blowers, and connecting pipes, all of which were mounted on the frame beneath the cab floor, one complete unit on each side of the locomotive.

As previously stated, the intake air is drawn from a point about 24 in. above and midway between the rails, through 6-in. galvanized sheet iron pipes, to a Sirocco type rotary blower capable of delivering 1,000 cu. ft. of free air per minute. The discharge pipes, 4 in. in diameter, terminate at points 12 in. above the floor in front of the cab seats, and direct the air streams at the positions of the fireman and engineman. The blowers were driven at 3,600 r.p.m. by small, direct-connected steam turbines, like those used for driving electric generators for the headlight. The turbine, blower, and base plate occupy a space approximately 16 in. by 19 in. by 16 in. high. Steam valves for the turbine were placed above the boiler in the cab with wheels arranged for convenient operation by the fireman.

Exact measurements of the volume of air delivered by the blowers were not made, but it was estimated to be more than 500 cu. ft. each per minute, or enough to replace the cab atmosphere at least twice a minute.

Description of the Tunnels and Test Trains

Tests were conducted in 19 tunnels between Charlottesville, Va., and Hinton, W. Va., a distance of 175.6 miles. This includes two engine and crew districts. In the mountain district, from Charlottesville, Va., to Clifton Forge, a distance of 93.6 miles, are eight tunnels, all single track. In the Allegheny district, between Clifton Forge, Va., and Hinton, W. Va., a distance of 79.3 miles, are 11 tunnels, three of single track and eight of double track. The Blue Ridge tunnel in the mountain district, 4,263 ft. long, with a grade westward of 1.3 per cent, is worst for westbound trainmen, while the Millboro tunnel, 1,335 ft. long, with a grade eastward of 1.4 per cent, is worst for eastbound trainmen. Of the tunnels in the Allegheny district the worst eastbound is Second Creek tunnel and westbound is Big Bend tunnel; both are single track tunnels. Big Bend tunnel is 6,478 ft. long with grade from both ends to a point 1,500 ft. from

the eastern portal. It is provided with a ventilating fan for blowing eastbound trains but not for westbound trains; despite a slight descending grade westbound it is necessary to work steam so that Big Bend tunnel westbound is the worst in the district.

Investigations were conducted on five trains at random. The five trips covered the two districts once in each direction, with one extra trip west from Clifton Forge to Hinton. Four of the tests were on locomotive No. 840, on which were the ventilating blowers, as described. At the time of the trip from Charlottesville to Clifton Forge, this locomotive went

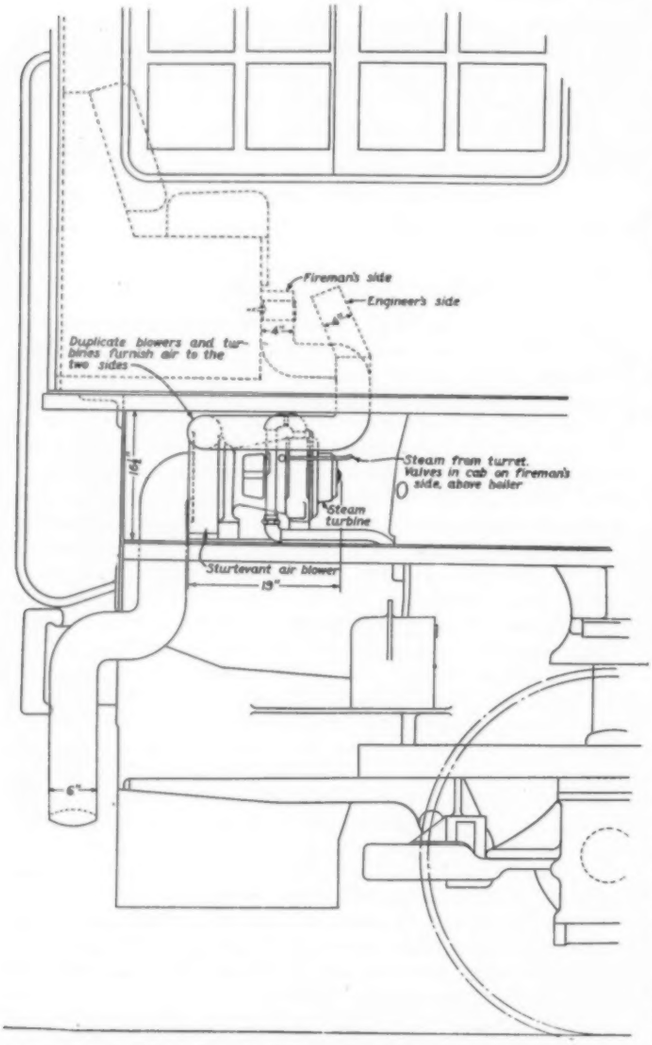

Fireman's side
Engineer's side
Duplicate blowers and turbines furnish air to the two sides
Steam from turret. Valves in cab on fireman's side, above boiler
Steam turbine
Sturtevant air blower
19"
6"

Fig. 1—Ventilating Equipment Installed on the Locomotive on Which Tests Were Made

without load, so that the test was made on locomotive No. 780 which followed with the next train. Both locomotives were of the Mallet type. No. 840 alone weighs 437,000 lb., and with tender, 614,000 lb. The tractive force as a simple engine is 94,000 lb. and as compound engine, 74,200 lb. No. 840 is equipped with Duplex mechanical stokers. No. 780 is similar to No. 840 but weighs 4,000 lb. more and has Street stokers.

Composition of Cab Atmospheres in Tunnels

The gas analyses did not indicate excessive amounts of carbon monoxide which is the poisonous constituent of flue gases produced by incomplete combustion of carbon. The highest found was 0.16 per cent in the Millboro tunnel. This might be dangerous in half an hour should a train be delayed in the tunnel or happen to stall, but would have no noticeable effect during the two minutes' duration of the usual passage. Four gas samples taken in the Lewis tunnel gave an average of 0.07 per cent carbon monoxide. It appears from the analyses that the gas hazard might become considerable in these tunnels only in case a train is delayed or stalled.

As a rule, the difficulty in breathing varies with the smoke, but this may not always follow when smoke is light and much irritating sulphur dioxide gas is evolved with the flue gas. The writers used commercially manufactured pocket-size respirators for smoke and gas when excessive irritation and difficult breathing were encountered. The worst condition was in the Millboro tunnel, but the respirators entirely eliminated the irritation and difficulty in breathing. These respirators were of a type having low resistance to passage of air, the resistance being one inch of water at an air-flow of 85 liters per minute (four in. is considered a tolerable maximum in gas masks). Difficulty has been found in breathing through gas respirators of higher resistance when in hot atmospheres in tunnels of the Union Pacific, but no difficulty was experienced in breathing through the respirators with one-inch resistance.

Temperatures in the Cabs

Especial attention was devoted to the determination of temperatures at different positions in the cab. Mercury or alcohol thermometers were used. The positions were taken to represent the temperatures as follows:

Position 1—Air in the discharge pipe from the blower on engineman's side.
Position 2—Beside engineman, inner side.
Position 3—Above roof of cab. Thermometer was attached horizontally on a catch at the rear edge of the roof.
Position 4—Under middle of roof near backboard.
Position 5—Beside fireman, inner side.
Position 6—Beside fireman, next to window, nearly over blower pipe.
Position 7—Air in the discharge pipe from the blower, fireman's side.
Position 8—Near boiler, man high (say six feet) left of center.
Position 9—Outer surface of boiler lagging. This was determined by hanging a thermometer against the boiler and loosely covering the bulb with suspended waste. Temperatures were not read while in the tunnels. Outside of tunnels the temperatures varied from 170 to 193 deg. F., usually dropping with the steam pressure.

Wet and dry bulb temperatures to indicate the humidity were determined by a man facing the boiler and standing on the apron between the locomotive and tender, or in the center of cab and swinging a Bureau of Mines sling psychrometer. The highest temperature noted on the wet-bulb thermometer towards the end of the passage through the tunnels was recorded, but since five to six minutes are needed for exact indications by wet-bulb thermometers even in a non-varying atmosphere, and the time was frequently shorter, the wet-bulb temperatures recorded are usually low. The dry-bulb thermometers were read following the wet bulb.

Temperatures at positions 1 to 8 were observed soon after entering the tunnels allowing some time for thermometers to change. The temperatures indicated can be considered only approximations because of the lag of thermometers. Higher temperatures are usually indicated on each succeeding round. Fig. 2 shows graphically the temperatures at each position in the cab.

All temperatures determined at each cab position are grouped together, each observation being placed according to the serial order of the round of observations, so that those made at one time occupy corresponding points on the graph. Contrary to expectation, the results show no important differences in temperatures whether in tunnels, running outside of tunnels, or standing still. The highest average is 142 deg. at position 4, just under the cab roof, representing the temperatures while in tunnels, with blowers operating. Temperatures at the positions near the engineman and fireman average about 100 deg. F., whether in or out of tunnels. Since the physiological effects are not represented by the temperature alone, the decrease in comfort while in the tunnels must be due to the greatly increased humidity

together with air movement; it has been determined that when temperatures of humid air exceed body temperature, any air motion increases the discomfort. It is unfortunate that more determination of wet-bulb temperatures were not secured. However, a few records of 97 to 107 deg. F. wet bulb show that sometimes the humidity is high enough to cause much discomfort.

Since the stack gases which enter the cab do not increase the temperatures to a noticeable extent, it would seem feasible to reduce the temperatures by increasing the boiler lagging. The smoke deflector, which causes the exhausts to stream through pipes, in streams directed upon the positions of the engine crew. The direct streams added some to their comfort, but the turbulence of the air in the cab was greatly increased so that the air impinged upon the boiler surface and became heated, with the result that outside of the direct streams no increase in comfort was felt, and sometimes the discomfort increased.

The temperatures of the mixture of exhaust gases and tunnel air above the roof of the cab were found much below those in the cab. High temperatures of exhaust gases entering the cab had previously been suspected of being the cause

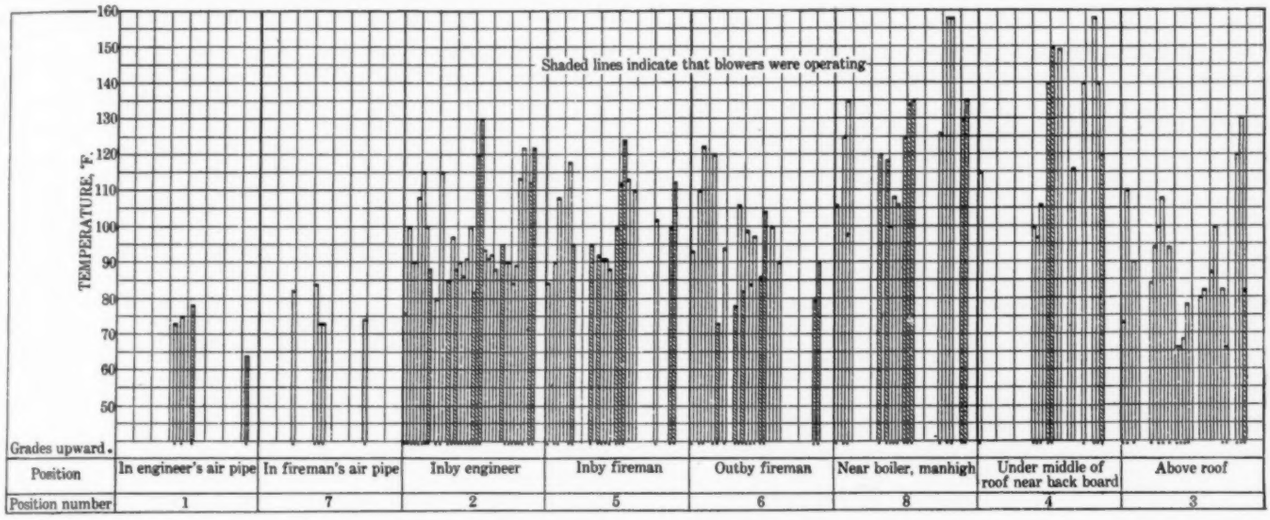


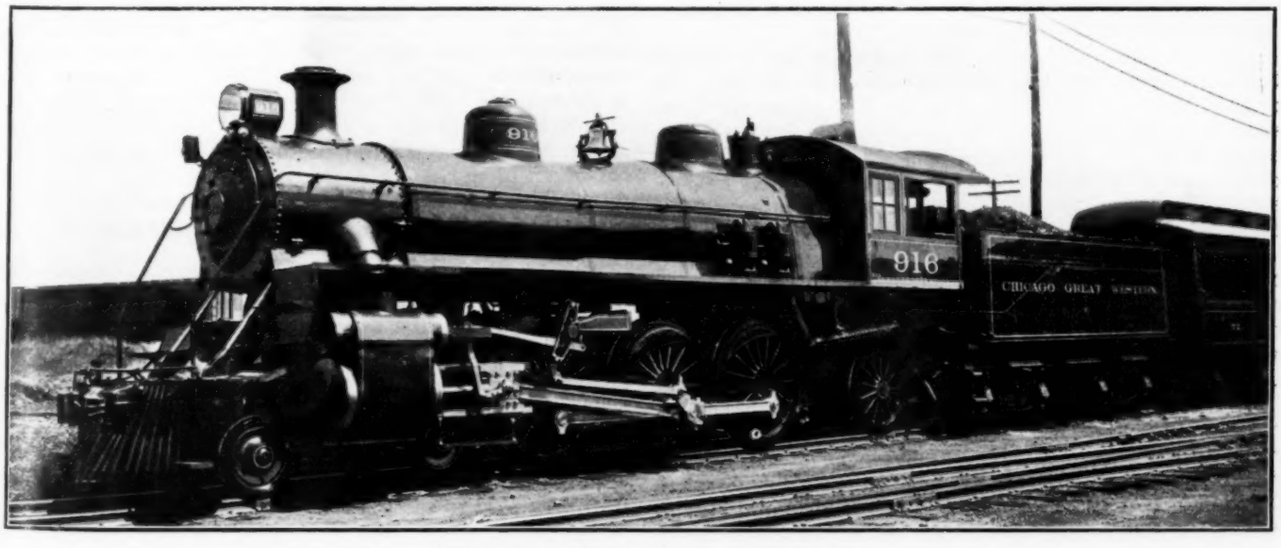
Fig. 2—Chart Showing Cab Temperatures While in Tunnels During Test Runs

backward over the cab without mixing with the tunnel air has been found especially good.

Summary and Conclusions

The temperatures in the cab were found to increase with the height above the floor, the highest temperature of 158 deg. F. being observed just under the middle of the roof of the cab. Blowers were tried, these taking air from a point about two feet above the center of the track and introducing it of the excessive heat felt, but this can not be true in the tunnels investigated. Rather the increased humidity of the cab air, while in the tunnels, due to the entrance of exhaust steam with the stack gases, seems to cause the discomfort.

Discomfort through heat may be lessened by increasing the lagging on the parts of the boiler exposed in the cab, and by means of the smoke deflector such as used by the Union Pacific, which causes exhaust gases to stream backward over and away from the cab.



An Exceptionally Attractive Locomotive

This locomotive, which pulls the Chicago Great Western's Rochester Limited, is highly resplendent. All outside piping is concealed. Its wheels are red with golden spokes. Side rods and cylinder heads are polished. The steam chest is aluminum colored. The smokestack is of English pattern.

The Training of Prospective Chief Clerks

By C. U. Stapleton
Supervisor of Office Methods, Canadian National Railways

A RAILWAY OFFICER was on an inspection trip. He visited a car shop. Everything was in its place and every man was busy. Efficiency, cleanliness and contentment were everywhere in evidence.

"I want to see the man who has effected this improvement since my last visit," remarked the officer. "I have a better place for him." When the shop foreman appeared and was congratulated it was discovered during the conversation that there was no one to replace him. He stated that he had been so busy keeping an eye on every operation that there was no time left to train an assistant. The comment of the official to the shop superintendent in this connection was both emphatic and significant: "Tell your foreman that if he wants to get a bigger job, he'd better have someone ready to take his place."

This remark may have a direct application to many engaged in railway office work. It's the understudy idea.

By training those who follow us, we are keeping in touch with the very details that those above us might ask us about unexpectedly. New thoughts, new duties crowd out the old routine, and, in a surprisingly short time we become rusty regarding that which was once second nature to us. The old order of things is often being supplanted, unknown to us, in our own organization by more progressive methods and unless we keep constantly posted, we have no assurance that the information we furnish may not be faulty. By teaching we learn. This is such a simple way of killing two birds with one stone that it should make a very strong appeal to common sense.

As a concrete example of the application of this principle let us take the office manager, or, as he is known in railway circles, the chief clerk. During the past few years in my work of organizing on a standard basis the office operations of the Canadian National Railways with its coast to coast ramifications it has been my privilege to work with and observe the activities of over a hundred chief clerks under varying conditions. It is probable that in early railway organizations the position of chief clerk was created to cover the supervision and instruction of staff, the periodical analysis of office procedure, and the centering of responsibility for office operations.

It is only fair to the chief clerks to examine the conditions that exist today as compared with those of the time of original railway organization. In the first place, the office staffs have not only multiplied themselves many times over, but secondly, and this is the greatest handicap of the chief clerks, their daily duties apart from supervision have become so onerous that these duties demand their attention to the exclusion of almost everything else.

It is most important that supervising work should receive their attention, but the indefinite postponement of this would only show in the final analysis covering a considerable period of time; whereas, the daily routine passing over their desks must be completed without delay, for the slightest neglect becomes immediately apparent.

The remedy is obvious and is founded on one of the proven tests of efficient organization. It is that every chief clerk should prepare the most capable man under him to take his place. As an employee he has an even more vital interest in adopting this policy than his employer, because when a vacancy occurs higher up he may not be spared to fill it unless he has an understudy. Some other man of equal ability who is not indispensable to his position often secures the promotion which under other circumstances would have been given to the man who still considers it an advantage to be thought indispensable.

The training of an assistant chief clerk necessitates a sufficient amount of work being assigned to him to coach him in the essential duties of a chief clerk's position. The natural result is a material lessening of the details now personally handled by the chief clerk, leaving him more time for the close inspection and analysis of the operations of his staff. He now has ample time to assist the man above him, train the man below him and supervise the office operations.

The man who trains an understudy not only places himself in line for promotion but also has the satisfaction of knowing that he is helping to build up a smoothly running organization which will move without friction during his absence. This will have the effect of decreasing the cost of office operations, while the salary paid the assistant will establish itself in his eyes as a stepping stone rather than a retainer of his services.

There is another angle of this subject that should not be overlooked and that is this final effect of Golden Rule practice. We are not always going to find it advisable or even possible to maintain the position of being all sufficient unto ourselves. One man can only work so long each day and do so much. If we neglect to develop those with less experience, on whom will we lean when the limit of our capacity has been reached? A division of authority and responsibilities must be made if we are to take care of the ever increasing mass of detail work which must be handled promptly.

We are now living in a period of more scientific railway methods and this has materially increased the number of variables that enter into all office operations. "Near enough" is no longer permissible; every item must be exact and subject to close scrutiny.

If we restrict the ambitions of the man below by not taking full advantage of his experience and capabilities he will certainly realize that we are not opening the door of opportunity and his return to us in loyalty will be surrounded by reservations in the same proportion. We can buy an employee's time but we can't get more than a dollar's worth for a dollar unless we can show him a chance to develop and advance as fast as his natural ability and experience will permit.

There are some who hesitate to impart knowledge to others through jealousy or fear that those others may become more important in the eyes of superiors. This is equivalent to admitting that with an even chance those others could beat them at their own game. To misuse the power given us to control others by restricting their development is not only a breach of the trust reposed in us but it also reacts against us by making us suspicious, narrow-minded and less capable of undertaking greater responsibilities. We cannot afford an attempt to retain our own prestige by the doubtful expedient of "holding out" on those below us. Office politics of this sort cannot be hidden for long and when brought to light destroy both the confidence of our seniors and the loyalty of our juniors.

Why should we pass on to unappreciative juniors the benefit of our knowledge gained in the hard school of experience? Because by instructing, helping, and developing others we improve ourselves, improve the organization and become more decided factors in it. Everything else being equal, the man who has trained a substitute for himself has "superior direction" over the man without a substitute. We all know that substantial assistance to the man ahead means eventual recognition, but do we give enough thought to the man behind?

A PRESS DISPATCH of August 29 reports more than 70 persons killed and many scores injured in a collision of passenger trains near Lahore, British India.

General News Department

The American Association of Passenger Traffic Officers will hold its 68th annual meeting at hotel Pennsylvania, New York City, on Thursday and Friday, October 2 and 3, the sessions beginning at 10 a. m.

The Western Railway Club will hold its regular meeting at the Auditorium hotel, Chicago, on Monday evening, September 15. The speaker will be Donald D. Conn of the Car Service division of the American Railway Association.

The Fox River & Union Electric Railroad, which was purchased by farmers of Kendall and Grundy counties in Illinois, began operation under its new management on September 8. The farmers bought the road after permission had been asked of the Interstate Commerce Commission to junk the property. The new owners will raise a fund to operate the road, contributing on the basis of the number of bushels of grain they ship over the railroad. The line extends from Morris, Ill., at which points it connects with the Chicago, Rock Island & Pacific north, 20 miles, to Yorkville, where it connects with the Aurora-Streator line of the Chicago, Burlington & Quincy.

Railway Mail Service Exhibit

The New York Central in conjunction with the United States government this week made an exhibit at the New York State Fair at Syracuse showing the work of the railway mail service. The display was in three mail cars, one of which was fitted up as a sub-station of the Syracuse post office. Motion pictures also were shown.

Canada Sells C. P. R. Stock Taken from Enemy Aliens

A large financial transaction has been effected by the Canadian government in connection with the disposal of Canadian Pacific stock that has been held for a special fund made up of proceeds of properties owned by former enemy aliens. This stock has been sold privately to an American syndicate headed by a Boston financial house. The price at which the block was taken was fairly close to the prevailing market price. The stock has advanced considerably during the period this stock has been in the hands of the Dominion government. The method of selling the stock privately has enabled the government to liquidate this account without affecting the market, and it is assumed that the disposal of this large block of stock will be done over a lengthy period to avoid wide fluctuations. It is believed that the proceeds realized by the government in the sale of this C. P. R. stock will be invested in government bonds pending distribution to those who are entitled to receive the money.

New Officers of Equipment Painting Section

At the third annual convention of the Equipment Painting Section, Mechanical Division, American Railway Association, held at Chicago as reported in the *Railway Age* of September 6, page 429, the following officers were elected: Chairman, F. W. Bowers, foreman painter, Erie, Kent, Ohio; first vice-chairman, A. E. Green, foreman painter, Chicago & North Western, Chicago; and second vice-chairman, James Gratton, general foreman painter, Buffalo, Rochester & Pittsburgh, Dubois, Pa. In addition to the three officers mentioned the following have been elected members of the Committee of Direction: H. C. Allehoff, foreman painter, Oregon-Washington Railroad & Navigation Company, Portland, Ore.; W. Mollendorf, foreman painter, Illinois Central, Chicago; J. McCarthy, foreman painter, Canadian National, Montreal, Que.; H. Hengeveld, master painter, Atlantic Coast Line, Waycross, Ga.; F. E. Long, foreman painter, Chicago, Burlington & Quincy, Aurora, Ill.; J. W. Gibbons, general foreman locomotive painter, Atchison, Topeka & Santa Fe, Topeka, Kans.; J. E. Gearhart, foreman painter, Pennsylvania, Altoona, Pa.; and B. E. Miller, master painter, Delaware, Lackawanna & Western, Kingsland, N. J.

Further Electrification on the New Haven

The New York, New Haven & Hartford announces that work has begun on the preparation, for electric operation, of its line from South Norwalk, Conn., northward to Danbury, 24 miles, and on the Ridgefield branch, 4 miles. When this change is made the complete electrification of the New York division will have been finished. Six passenger trains a day are operated over the Danbury line southward and seven northward, and there is a considerable freight traffic.

It is hoped to complete the improvement by January next. It is expected to secure substantial economies in the utilization of electric locomotives.

Brotherhoods Still Defy Labor Board

Representatives of the Brotherhood of Locomotive Engineers and the Brotherhood of Locomotive Firemen & Enginemen again failed to appear before the Railroad Labor Board on September 8 when the hearing on proposed wage increases for enginemen of the western railways was re-opened. It is the purpose of the brotherhood, according to Donald Richberg, their attorney, to force the Labor Board to appeal to the United States District Court at Chicago for an order compelling the enginemen's representatives to testify. The brotherhoods will then have opportunity to voice their argument that the Labor Board is without power to intervene in disputes on its own motion.

The appointment last week of an attorney for the Labor Board indicated that application would soon be made to the United States District Court at Chicago for an order to compel the brotherhoods to testify in the pending controversy. It was expected that this action would be taken as soon as the Labor Board had finished hearing additional testimony of railway representatives on the wage dispute.

C. N. R. President and Canadian Railway Minister Warn Against Further Rate Reductions

With the rapid approach of the hearing by the Dominion Board of Railway Commissioners of the complaints of Canadian shippers of the discrimination resulting from a restoration to full effect on July 7 last of the Crow's Nest Pass Agreement on freight rates the speeches made at the Canadian National Exhibition in Toronto last week of George P. Graham, Minister of Railways and Canals, and of Sir Henry Thornton warning the public against any further reduction of freight rates have caused a stir in freight-producing districts in East and West.

"It is futile," said Mr. Graham, "to ask for the lowering of freight rates and passenger charges so long as operating expenses are in the clouds. We cannot stand many more reductions. The way to remedy the conditions is to cut the cost of operation, and to bring to the Dominion more people, to produce more to be carried on the railways of Canada."

"The Canadian National Railways belong to you," said Sir Henry Thornton, president of the road, "and you can do what you see fit with them, but may I give you my earnest assurance that any reduction of rates will simply mean a postponement of that day when the deficits will be wiped out. It would be an impertinence for me to tell Canada what to do in the matter of freight rates. You can do as you like, the railway is yours, but the lower the freight rates become the further is postponed the day of catching up with the capital expenditures. We have to steer a difficult course between reduced freight rates and higher taxes."

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1924

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1923.
Akron, Canton & Youngstown	July	170	$193,667	$583	$202,074	$32,506	$21,131	$9,909	$57,955	$9,665	$131,163	64.90	$70,911	$57,791	$32,206	$22,023
	7 mos.	170	1,472,028	4,948	1,533,884	214,485	162,392	66,228	434,691	68,931	943,856	61.50	590,028	496,171	316,240	311,958
Alabama & Vicksburg	July	141	196,685	63,291	278,521	47,695	58,680	10,146	96,782	15,148	229,709	82.30	48,812	26,500	30,469	45,315
	7 mos.	141	1,432,490	429,524	1,999,528	339,826	399,744	67,235	684,941	95,258	1,600,094	80.00	399,433	233,745	259,210	307,060
Vicksburg, Shreveport & Pacific	July	188	228,263	83,652	334,093	64,900	41,623	11,778	120,806	14,901	256,592	76.80	77,501	53,457	43,424	62,316
	7 mos.	188	1,600,475	616,209	2,386,585	427,805	433,722	83,912	857,046	104,560	1,924,313	80.60	462,272	313,722	208,310	405,368
Ann Arbor	July	293	354,881	39,738	415,871	108,826	5,522	9,265	169,739	13,092	306,444	73.70	109,427	80,627	58,525	90,161
	7 mos.	293	2,704,227	270,823	3,101,100	374,018	584,903	65,568	1,327,920	99,371	2,451,920	79.10	649,180	489,583	281,944	23,599
Atchison, Topeka & Santa Fe	July	9,120	10,859,091	3,837,780	15,940,062	2,912,643	3,462,993	302,298	4,880,068	339,383	11,821,163	74.10	4,118,899	2,888,592	2,978,817	2,841,012
	7 mos.	9,028	67,757,931	26,227,032	103,333,214	17,238,292	26,484,347	2,140,676	34,591,179	2,465,524	82,162,569	79.50	21,176,645	13,924,028	14,771,035	22,863,255
Gulf, Colorado & Santa Fe	July	1,908	1,850,385	356,798	2,323,334	412,921	501,469	45,147	655,480	61,180	1,673,372	72.00	649,962	565,834	459,533	392,367
	7 mos.	1,908	10,946,356	2,286,716	14,117,941	3,317,389	3,752,058	323,477	4,755,548	437,582	12,573,686	89.10	1,544,255	948,888	369,332	572,793
Panhandle & Santa Fe	July	858	724,529	125,994	892,938	152,215	228,047	8,087	281,947	17,778	687,479	77.00	2,054,459	180,081	130,674	27,066
	7 mos.	858	4,030,216	843,219	5,172,331	1,002,803	1,503,229	55,737	1,636,963	130,304	4,326,175	83.60	846,156	672,641	395,338	111,913
Atlanta & West Point	July	93	114,764	73,415	215,642	27,959	44,222	8,924	80,426	11,024	177,370	82.20	38,272	27,013	19,713	25,284
	7 mos.	93	928,877	509,844	1,653,891	230,664	317,536	60,338	615,688	77,277	1,333,269	80.60	320,622	237,597	160,656	238,537
Western of Alabama	July	133	140,290	68,307	229,889	20,310	52,202	9,257	80,757	10,703	177,480	77.20	52,409	42,785	43,171	41,102
	7 mos.	133	1,105,792	480,518	1,761,079	226,034	368,012	67,878	555,796	77,332	1,325,313	75.20	435,766	349,053	320,797	339,848
Atlanta, Birmingham & Atlantic	July	639	326,068	55,117	407,944	74,186	85,636	25,053	168,004	15,912	368,849	90.40	39,095	26,139	7,656	—9,982
	7 mos.	639	2,225,150	304,904	2,745,983	511,382	595,283	156,825	1,173,018	112,185	2,549,195	92.80	196,788	106,740	16,824	—186,376
Atlantic Coast Line	July	4,864	3,944,526	1,178,667	5,530,374	1,086,780	1,408,736	123,244	2,248,146	158,643	5,044,807	91.20	485,567	83,872	125,132	—11,111
	7 mos.	4,865	35,128,633	11,231,317	50,313,018	6,050,556	9,797,487	881,267	17,617,027	1,079,893	35,698,152	71.00	14,614,866	11,604,027	10,832,909	10,182,283
Charleston & Western Carolina	July	342	248,121	31,311	292,820	62,677	51,121	7,378	118,743	6,376	246,295	84.10	46,525	29,007	27,842	30,681
	7 mos.	342	1,942,179	215,123	2,263,597	483,125	346,082	50,738	935,826	47,550	1,863,321	82.30	400,276	277,101	206,446	401,121
Baltimore & Ohio	July	5,303	13,723,327	2,525,284	17,503,623	2,075,415	3,350,884	352,779	6,526,929	513,158	12,966,064	74.10	4,537,559	3,708,965	3,480,654	3,876,611
	7 mos.	5,303	102,759,849	16,828,452	128,226,890	16,340,464	27,762,386	2,528,997	50,001,192	3,622,028	101,210,121	78.90	27,016,769	21,042,868	19,248,131	26,702,519
Baltimore & Ohio Chic. Terminal	July	80	.....	.....	300,856	59,149	50,807	1,581	164,258	5,728	298,426	99.20	2,430	—39,170	47,025	—2,131
	7 mos.	80	.....	.....	2,058,037	381,630	351,563	13,075	1,232,754	63,308	2,057,526	100.00	511	—277,256	21,040	257,476
Staten Island Rapid Transit	July	23	89,115	152,622	282,508	101,153	31,844	1,973	124,935	15,182	275,087	97.40	7,421	— 11,681	—27,398	11,623
	7 mos.	23	635,543	758,652	1,568,947	313,805	233,586	15,151	845,327	106,115	1,513,984	96.50	54,963	—57,796	—147,953	—147,350
Bangor & Aroostook	July	616	286,721	51,471	364,943	106,374	110,047	5,325	136,552	18,480	378,854	103.80	—13,911	38,871	15,234	29,744
	7 mos.	616	3,417,105	481,881	4,068,437	732,262	946,720	31,008	1,185,046	138,864	3,046,565	74.90	1,021,872	729,627	969,932	811,611
Belt Ry. Co. of Chicago	July	32	.....	.....	516,968	66,642	34,923	2,982	210,990	9,067	324,604	62.80	192,364	146,493	131,971	170,030
	7 mos.	32	.....	.....	3,835,574	354,566	390,582	19,098	1,827,927	72,541	2,674,714	69.70	1,160,860	865,025	949,563	1,063,321
Bessemer & Lake Erie	July	228	1,694,138	25,762	1,744,817	131,194	436,067	13,475	411,451	28,470	1,013,342	58.10	731,475	673,971	666,115	880,308
	7 mos.	228	8,194,431	169,807	8,520,735	1,020,143	3,259,676	107,173	2,480,103	210,882	7,015,649	82.30	1,505,086	1,182,437	1,463,211	4,511,435
Bingham & Garfield	July	33	40,327	2	41,950	11,002	3,345	1,280	10,099	4,353	30,181	71.90	11,769	1,275	15,086	2,034
	7 mos.	34	262,873	12	273,357	56,377	38,190	10,508	72,896	29,256	208,444	76.30	64,913	—8,035	97,166	98,648
Boston & Maine	July	2,287	3,722,942	2,002,407	6,522,683	839,813	1,360,360	65,135	2,759,759	238,532	5,285,020	81.30	1,237,663	975,773	733,087	616,140
	7 mos.	2,287	27,153,252	12,311,368	44,942,309	5,756,866	9,451,919	389,663	20,285,663	1,620,980	37,656,295	83.80	7,286,014	5,536,675	4,030,508	—220,862
Brooklyn Eastern District Terminal	July	9	108,109	.....	114,651	5,593	14,907	652	45,306	5,057	71,515	62.40	43,136	34,702	35,942	20,397
	7 mos.	9	786,253	.....	836,308	61,955	85,907	2,992	309,867	36,760	497,481	59.50	338,827	287,370	295,930	358,293
Buffalo & Susquehanna R. R. Corp.	July	253	105,123	3,754	112,601	33,536	53,350	1,852	38,014	8,597	135,349	120.20	—22,748	—25,148	—8,251	49,712
	7 mos.	253	1,034,337	37,219	1,098,053	243,224	495,542	13,663	360,289	64,210	1,176,928	107.20	—78,875	—112,179	88,054	484,229
Buffalo, Rochester & Pittsburg	July	591	997,791	141,367	1,208,513	99,147	341,108	25,062	472,798	40,817	980,034	81.10	228,479	198,475	222,851	234,785
	7 mos.	591	7,862,406	975,397	9,278,596	920,342	2,990,483	178,137	3,751,427	289,107	8,139,911	87.70	1,138,685	912,943	1,221,527	1,931,104
Canadian Pacific, Lines in Maine	July	233	83,845	28,870	126,290	172,208	29,594	5,094	66,197	3,375	276,468	218.90	—150,178	—161,178	—169,046	—57,647
	7 mos.	233	1,291,934	252,944	1,654,493	472,332	345,999	32,821	735,877	25,380	1,612,409	97.40	42,084	—34,916	—128,723	15,205
Carolina, Clinchfield & Ohio	July	309	636,681	37,772	687,611	88,950	149,769	26,316	168,494	19,188	452,308	65.80	235,303	185,253	196,865	264,739
	7 mos.	309	4,466,761	266,183	4,836,035	545,796	1,180,689	183,677	1,295,100	140,484	3,343,448	69.10	1,492,587	1,142,275	1,399,969	1,643,681
Central of Georgia	July	1,920	1,760,914	459,674	2,390,203	363,825	404,216	71,267	914,727	88,225	1,831,729	76.60	558,474	454,938	395,920	311,907
	7 mos.	1,920	10,940,447	3,172,306	15,531,374	2,383,504	2,804,461	485,924	5,933,151	630,344	12,229,963	78.70	3,301,411	2,565,727	2,473,157	2,413,833
Central of New Jersey	July	691	3,480,594	1,083,210	4,831,983	507,893	515,897	40,653	1,785,331	113,866	2,983,244	61.70	1,848,739	1,483,717	1,365,794	815,181
	7 mos.	692	24,331,192	5,378,625	31,632,593	3,365,930	7,705,719	256,926	12,836,833	767,663	25,064,489	79.20	6,568,104	3,995,243	3,406,872	3,331,749
Central Vermont	July	434	548,000	120,000	757,145	136,148	105,155	15,304	318,945	22,921	596,976	78.80	160,169	141,142	124,834	26,534
	7 mos.	434	3,833,842	701,361	5,037,783	1,021,904	853,813	91,868	2,356,914	168,219	4,500,112	89.30	537,671	404,806	198,419	—111,137
Chesapeake & Ohio	July	2,555	7,542,638	980,126	8,952,582	1,357,046	2,512,542	98,580	2,607,843	227,689	6,826,647	76.30	2,125,935	1,745,087	1,866,703	1,976,108
	7 mos.	2,556	51,058,130	6,265,442	60,160,467	8,326,288	15,914,543	680,319	19,004,137	1,467,461	45,602,474	75.80	14,557,993	11,922,588	12,870,242	11,404,153
Chicago & Alton	July	1,050	1,690,639	562,774	2,454,144	367,954	503,633	70,669	864,712	54,071	1,847,147	75.30	606,997	516,054	413,203	346,056
	7 mos.	1,050	11,934,944	3,716,750	17,253,651	2,286,671	4,116,175	427,439	6,474,471	425,707	13,638,229	79.10	3,615,422	2,972,730	2,279,523	2,735,580

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1924—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1923.
Chicago & Eastern Illinois	July	945	$1,402,910	$402,836	$1,957,171	$208,398	$572,676	$50,042	$782,192	$67,504	$1,693,295	86.50	$263,876	$132,876	$57,762	$167,845
	7 mos.	945	10,802,070	2,776,707	14,755,559	1,573,803	4,514,589	354,547	6,183,825	482,934	13,208,729	89.50	1,546,830	760,710	291,377	1,885,144
Chicago & North Western	July	8,462	8,337,418	2,610,446	12,370,882	2,233,422	2,482,756	185,258	4,675,830	338,213	9,976,979	80.60	2,393,903	1,641,553	1,549,838	1,582,475
	7 mos.	8,462	57,007,150	17,259,241	83,688,766	12,101,148	18,277,763	1,149,686	35,761,444	2,434,905	70,175,793	83.90	13,512,973	8,217,312	7,215,144	6,563,412
Chicago, Burlington & Quincy	July	9,402	8,816,013	2,539,532	12,626,305	1,602,734	2,575,958	241,504	4,564,941	360,296	9,451,134	74.90	3,175,171	2,292,324	2,029,860	522,018
	7 mos.	9,405	64,113,225	15,291,105	88,569,284	10,320,233	19,487,658	1,742,793	33,169,350	2,497,450	67,790,083	76.50	20,779,201	14,642,804	12,914,478	11,553,862
Chicago Great Western	July	1,496	1,476,311	334,511	1,975,033	382,733	353,147	76,837	770,348	53,686	1,649,985	83.50	325,048	251,975	143,442	—14,642
	7 mos.	1,496	10,153,910	2,288,339	13,571,234	2,038,551	2,814,483	466,177	5,890,596	378,934	11,665,125	86.00	1,906,109	1,378,599	726,911	851,162
Chicago, Indianapolis & Louisville	July	654	964,229	244,327	1,340,427	145,679	234,756	32,289	456,596	35,247	916,960	68.40	423,467	336,844	211,827	174,577
	7 mos.	654	7,000,670	1,771,701	9,732,246	1,039,049	2,038,883	232,880	3,562,601	243,009	7,221,832	74.20	2,510,414	1,998,331	1,102,636	1,198,182
Chicago, Milwaukee & St. Paul	July	10,986	9,015,447	1,945,569	12,288,253	1,900,302	2,337,956	240,257	4,758,718	359,059	9,666,687	78.70	2,621,566	1,860,894	1,534,537	1,626,996
	7 mos.	10,986	64,736,567	13,005,011	87,153,228	13,508,150	20,160,314	1,399,162	35,670,403	2,338,803	73,515,383	84.40	13,637,845	8,087,991	5,849,756	8,296,011
Chicago, Peoria & St. Louis	July	247	69,406	11,312	90,285	21,026	16,604	1,666	49,424	8,080	96,800	107.20	—6,515	—10,016	—26,381	—26,034
	7 mos.	247	541,933	91,741	702,397	127,484	121,016	12,412	386,240	57,541	704,693	100.30	—2,296	—27,246	—171,154	—191,462
Chicago River & Indiana	July	19	.....	.....	530,715	69,854	71,687	927	217,862	11,683	372,013	70.10	158,702	126,081	228,614	248,917
	7 mos.	19	.....	.....	4,021,247	510,010	457,068	6,304	1,637,126	81,800	2,692,308	67.00	1,328,939	1,068,667	1,782,115	1,938,320
Chicago, Rock Island & Pacific	July	7,594	7,874,468	2,094,000	10,741,454	1,374,120	2,464,071	234,650	4,219,824	288,680	8,637,012	80.40	2,104,442	1,558,960	940,266	1,166,532
	7 mos.	7,623	48,215,976	14,510,436	67,749,187	7,984,861	15,727,736	1,471,853	28,890,918	2,049,344	56,143,704	82.90	11,605,483	7,898,901	4,957,557	4,872,504
Chicago, Rock Island & Gulf	July	461	507,204	81,316	630,993	87,672	76,315	15,971	233,494	16,129	431,823	68.40	199,170	186,659	128,905	120,919
	7 mos.	461	2,764,956	540,086	3,586,066	518,232	482,915	99,025	1,477,723	114,526	2,706,726	75.50	879,340	791,319	539,500	112,826
Chicago, St. Paul, Minn. & Omaha	July	1,749	1,469,745	485,448	2,127,250	433,994	418,220	33,314	882,210	69,911	1,845,813	86.80	281,437	162,639	104,502	45,914
	7 mos.	1,749	10,726,379	3,435,648	15,372,192	2,114,289	3,093,410	249,735	6,923,559	508,121	12,935,140	84.10	2,437,052	1,568,843	1,222,178	1,212,718
Cincinnati, Indianapolis & Western	July	347	319,827	31,331	372,779	58,894	73,246	14,059	139,694	17,773	304,410	81.70	68,369	49,869	24,623	31,883
	7 mos.	347	2,108,403	220,808	2,487,993	345,810	521,162	95,477	1,029,346	126,108	2,122,529	85.30	365,464	239,502	98,125	147,610
Colorado & Southern	July	1,099	710,079	206,928	1,011,190	178,883	192,194	15,990	385,886	44,458	827,768	81.90	183,422	120,471	108,315	—32,694
	7 mos.	1,099	5,431,634	1,039,221	7,054,342	951,237	1,742,821	99,703	2,817,950	305,223	5,971,663	84.70	1,082,679	643,095	606,226	179,222
Ft. Worth & Denver City	July	456	662,172	192,128	906,314	103,703	154,161	20,929	225,965	34,986	546,834	60.30	359,480	320,027	301,518	263,541
	7 mos.	456	4,127,767	1,089,353	5,551,074	566,977	1,225,371	107,177	1,675,820	245,020	3,836,397	69.10	1,714,677	1,434,127	1,507,017	1,259,121
Wichita Valley	July	271	89,015	21,609	118,497	17,463	12,386	.....	36,186	2,102	66,801	56.40	51,696	44,146	28,361	23,315
	7 mos.	271	761,937	160,933	981,525	163,589	77,062	204	298,810	13,948	548,966	55.90	432,559	379,048	250,835	122,160
Columbus & Greenville	July	167	94,040	23,927	125,342	50,873	19,392	2,852	30,711	10,219	113,664	90.70	11,678	10,127	790	—36,580
	7 mos.	167	645,710	180,562	875,538	255,431	113,243	19,441	311,923	66,989	765,148	87.40	110,390	100,308	29,893	—26,324
Delaware & Hudson	July	894	3,164,533	366,547	3,755,439	410,778	920,416	51,146	1,303,771	133,839	2,845,790	75.80	909,649	806,949	841,476	954,726
	7 mos.	894	22,483,712	2,002,744	25,924,869	3,313,442	7,036,319	324,014	10,010,981	976,056	21,803,401	84.10	4,121,468	3,398,578	3,602,479	3,465,301
Delaware, Lackawanna & Western	July	992	4,946,630	1,290,417	7,047,545	723,696	1,492,285	121,062	2,583,142	164,205	5,137,980	72.90	1,909,565	1,336,706	1,386,372	1,778,639
	7 mos.	992	36,629,835	7,688,424	49,938,219	4,582,127	10,874,028	830,017	20,096,761	1,127,944	37,874,929	75.80	12,063,290	8,256,106	8,667,976	7,151,289
Denver & Rio Grande Western	July	2,609	1,816,073	654,968	2,761,042	821,512	811,658	52,085	831,770	86,399	2,635,453	95 50	125,589	—42,262	14,759	88,307
	7 mos.	2,601	12,766,556	2,931,691	17,211,642	3,152,794	4,700,194	360,956	5,832,589	592,028	14,873,123	86.40	2,338,519	1,165,491	1,605,932	1,085,592
Denver & Salt Lake	July	255	171,200	40,418	234,534	126,991	79,618	1,625	65,750	6,663	280,647	119.70	—46,113	—55,113	—49,447	35,626
	7 mos.	255	1,223,529	184,474	1,561,619	478,528	648,080	8,961	505,584	46,020	1,687,173	108.00	—125,554	—188,563	—138,726	—67,663
Detroit & Mackinac	July	375	134,093	27,409	178,330	33,970	38,163	1,826	56,905	9,773	139,701	78.30	38,629	28,454	32,602	10,676
	7 mos.	375	830,206	186,345	1,112,425	211,508	264,337	14,140	419,909	43,724	950,462	85.40	161,963	86,015	141,233	38,041
Detroit & Toledo Shore Line	July	61	220,110	.....	221,763	31,162	19,864	2,761	70,490	7,356	131,633	59.40	90,130	67,937	9,201	23,701
	7 mos.	61	1,932,412	.....	1,959,923	243,379	214,950	20,271	656,043	52,065	1,186,708	60.50	773,215	613,607	67,632	506,837
Detroit Terminal	July	18	.....	.....	183,483	51,211	14,505	24	88,753	1,578	156,071	85.10	27,412	12,486	13,382	56,307
	7 mos.	18	.....	.....	1,374,508	219,216	83,075	60	712,010	11,829	1,026,190	74.70	348,318	213,616	306,505	285,893
Detroit, Toledo & Ironton	July	468	836,983	10,470	870,488	208,876	137,003	5,768	253,059	26,949	630,260	72.40	240,228	202,554	103,348	206,021
	7 mos.	468	6,727,537	58,811	6,902,102	938,679	1,106,788	48,884	1,965,340	178,255	4,226,014	61.20	2,676,088	2,427,139	1,613,575	1,065,888
Duluth & Iron Range	July	280	788,732	9,419	861,869	123,515	116,836	1,373	206,685	19,821	468,634	54.40	393,235	336,392	344,101	539,555
	7 mos.	280	3,124,621	94,136	3,516,428	777,815	909,058	8,309	1,201,741	149,764	3,044,625	86.60	471,803	236,765	233,169	728,778
Duluth, Missabe & Northern	July	304	2,065,312	8,715	2,223,239	195,657	173,397	3,512	330,977	19,976	724,180	32.60	1,499,059	1,296,391	1,289,580	2,428,963
	7 mos.	305	6,863,027	80,571	7,467,868	1,271,764	1,418,847	21,844	1,678,030	140,211	4,535,588	60.70	2,932,280	1,950,446	1,920,983	3,854,855
Duluth, South Shore & Atlantic	July	591	385,388	99,362	546,464	120,462	71,205	6,479	210,378	10,830	425,093	77.80	121,371	89,369	72,860	73,093
	7 mos.	591	2,530,313	669,479	3,488,169	600,679	557,481	44,016	1,509,110	77,471	2,827,546	81.10	660,623	441,520	272,118	209,748
Duluth, Winnipeg & Pacific	July	178	109,851	15,596	130,267	38,107	34,726	3,084	63,893	8,097	149,975	115.10	—19,708	—26,059	—24,678	—7,887
	7 mos.	178	1,150,406	133,900	1,324,076	254,573	241,476	22,569	545,569	60,671	1,131,927	85.50	192,149	125,435	137,777	108,513
Elgin, Joliet & Eastern	July	459	1,227,199	72	1,333,069	211,256	339,830	11,440	507,218	37,946	1,107,568	83.10	225,501	143,557	57,588	607,316
	7 mos.	459	11,699,262	401	12,904,197	1,361,044	3,073,691	86,478	4,640,422	286,206	9,446,352	73.20	3,457,845	2,883,365	1,722,662	4,024,723
El Paso & Southwestern	July	1,139	926,088	160,124	1,150,424	180,301	171,258	34,915	301,559	45,904	743,656	64.60	406,768	307,009	220,072	208,113
	7 mos.	1,139	5,803,447	1,239,016	7,422,161	1,254,310	1,464,729	258,343	2,131,726	296,938	5,470,855	73.70	1,951,306	1,339,084	936,675	1,216,340

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1924—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1923.
Erie	July	2,055	$6,600,121	$1,301,906	$8,598,108	$1,107,153	$2,306,331	$132,104	$3,266,475	$281,972	$7,118,976	82.80	$1,479,132	$1,126,567	$1,168,651	$1,509,650
	7 mos.	2,055	47,423,404	7,597,341	59,969,107	7,499,117	16,414,239	1,007,925	23,832,742	1,970,589	50,994,007	85.00	8,975,100	6,535,821	7,859,664	9,740,531
Chicago & Erie	July	269	845,047	87,572	1,032,397	138,089	156,824	20,544	356,592	34,976	706,592	68.40	325,805	272,992	7,275	—12,226
	7 mos.	269	6,876,425	442,757	7,984,930	852,895	1,076,073	156,516	2,831,623	255,675	5,171,267	64.80	2,813,663	2,444,574	483,155	—263,388
New Jersey & New York	July	45	21,006	116,161	141,898	21,485	19,425	1,617	59,860	3,227	105,614	74.40	36,284	32,617	301	—4,192
	7 mos.	45	163,885	717,767	917,137	132,011	140,827	8,889	447,955	25,152	754,805	82.30	162,332	136,477	—64,589	—93,297
N. Y., Susquehanna & Western	July	135	321,746	65,452	426,548	85,674	70,361	3,884	196,231	10,636	306,767	86.00	59,781	30,496	16,882	—22,559
	7 mos.	135	1,979,809	415,939	2,710,161	406,534	591,770	25,871	1,443,115	75,173	2,542,365	93.80	167,796	—42,955	—134,693	66,971
Evansville, Ind. & Terre Haute	July	143	121,679	4,682	132,630	52,897	11,958	1,885	51,686	3,350	121,776	91.80	10,854	5,980	—18,487	9,611
	7 mos.	141	900,923	44,048	986,941	241,440	107,108	13,107	402,589	23,669	772,612	78.30	214,329	180,692	43,351	—67,268
Florida East Coast	July	763	758,108	286,423	1,177,167	228,214	271,287	10,329	433,845	35,122	985,472	83.70	191,695	92,928	35,960	—120,539
	7 mos.	763	6,941,170	3,734,941	12,102,271	1,580,789	1,836,157	120,066	3,901,292	241,433	7,778,497	64.30	4,323,774	3,624,595	2,940,659	3,033,331
Fort Smith & Western	July	249	109,567	18,492	135,270	26,026	25,579	5,056	43,906	7,526	108,750	80.40	26,520	20,696	6,773	2,572
	7 mos.	249	747,752	131,926	943,598	205,763	186,241	36,649	351,302	54,076	829,601	87.90	113,997	72,144	—30,562	39,309
Galveston Wharf Co.	July	13	.....	.....	75,993	39,324	3,033	850	25,492	2,575	76,498	100.70	—505	—20,505	—20,432	—3,691
	7 mos.	13	.....	.....	627,741	275,492	28,376	5,899	191,218	18,996	549,453	87.50	78,288	—42,997	—42,859	53,864
Georgia R. R.	July	328	374,133	97,294	501,352	58,596	90,679	22,272	233,746	19,915	424,012	84.60	77,340	70,535	59,915	70,382
	7 mos.	328	2,535,798	668,720	3,440,149	385,451	676,598	155,287	1,538,506	148,699	2,889,314	84.00	550,835	501,838	427,151	576,336
Georgia & Florida	July	406	122,656	18,079	149,096	17,319	19,626	8,931	58,233	8,315	112,659	75.60	36,437	30,029	16,357	18,365
	7 mos.	406	807,783	127,894	997,141	120,429	143,429	58,491	387,813	56,678	768,423	77.10	228,718	183,220	95,713	111,690
Grand Trunk Western	July	347	1,117,767	237,625	1,456,872	198,396	363,637	45,461	548,241	47,309	1,214,763	83.40	242,109	162,768	1,160	227,883
	7 mos.	347	8,854,939	1,281,917	10,787,215	1,310,132	2,904,291	310,156	4,304,811	353,443	9,237,816	85.60	1,549,399	1,028,574	—166,336	1,162,336
Atlantic & Saint Lawrence	July	166	100,306	37,089	153,100	28,828	32,258	6,658	97,749	11,599	173,838	113.54	—20,738	—42,054	—88,251	—283,222
	7 mos.	166	1,093,895	235,403	1,435,802	396,020	298,434	41,867	858,207	66,136	1,672,794	116.50	—236,992	—349,255	—781,692	—1,164,095
Chic., Detroit & Can. Gr. Tr. Jct.	July	59	145,331	6,283	181,715	32,194	7,374	6,104	77,470	3,175	126,330	69.50	55,585	41,422	15,781	125,949
	7 mos.	59	1,441,991	60,417	1,755,558	201,677	76,120	41,096	596,063	23,496	938,423	53.50	817,135	741,334	554,218	869,201
Detroit, Gr. Haven & Milwaukee	July	189	407,138	30,950	478,039	123,442	31,228	14,272	216,167	14,206	399,633	83.60	78,406	72,468	—13,548	25,208
	7 mos.	189	3,182,175	268,728	3,757,783	667,398	324,962	96,743	1,713,101	106,673	2,910,430	77.50	847,353	810,367	191,940	281,371
Great Northern	July	8,251	6,859,643	1,309,848	9,120,577	1,504,995	1,438,295	182,420	2,988,110	215,257	6,335,404	69.50	2,785,173	1,909,778	1,911,879	2,469,897
	7 mos.	8,251	41,284,891	7,539,619	54,798,236	8,318,047	9,820,446	1,245,474	21,303,537	1,526,142	42,403,367	77.40	12,394,869	6,885,911	7,721,980	6,761,167
Green Bay & Western	July	234	97,406	8,236	112,939	33,616	20,500	3,950	38,260	2,833	99,144	87.70	13,795	6,295	—445	13,591
	7 mos.	234	696,830	102,660	848,913	153,699	154,229	23,726	314,938	17,552	664,094	78.20	184,819	132,271	101,071	77,345
Gulf Coast Lines	July	922	770,405	177,352	1,012,720	208,962	146,637	30,284	277,411	37,454	696,879	68.81	315,841	251,300	228,353	313,148
	7 mos.	922	6,536,163	1,241,718	8,270,965	1,279,152	1,051,886	209,642	2,102,545	261,474	4,893,439	59.16	3,377,526	2,976,040	2,569,579	1,672,333
Gulf & Ship Island	July	307	189,550	40,970	262,660	45,040	49,048	8,395	79,021	12,391	203,459	77.50	59,201	35,653	30,387	23,846
	7 mos.	307	1,524,751	263,081	2,022,290	332,799	293,452	57,075	597,466	94,877	1,445,369	71.50	576,921	398,414	340,460	279,621
Gulf, Mobile & Northern	July	465	404,930	35,914	459,011	81,729	75,182	18,906	138,229	20,528	334,574	72.89	124,437	95,749	92,127	92,504
	7 mos.	465	3,001,837	270,177	3,410,799	542,691	533,174	151,184	1,094,272	139,017	2,457,558	72.05	953,241	757,246	671,606	564,992
Hocking Valley	July	348	1,360,799	69,430	1,594,216	169,892	442,087	14,813	443,559	39,408	1,109,638	69.60	484,578	393,338	416,241	305,331
	7 mos.	348	8,445,738	530,513	9,768,520	995,757	2,798,263	96,643	2,988,589	255,364	7,133,855	73.00	2,634,665	1,985,017	2,179,349	1,955,555
Illinois Central	July	4,847	8,719,426	2,019,063	11,509,950	1,655,750	3,075,636	194,573	4,087,146	314,445	9,377,241	81.50	2,132,709	1,394,567	1,510,685	1,376,912
	7 mos.	4,847	65,531,550	14,983,677	86,954,142	11,157,618	20,387,699	1,392,559	32,798,744	2,229,764	68,226,880	78.50	18,727,262	12,934,752	13,836,467	14,081,056
Yazoo & Mississippi Valley	July	1,380	1,162,007	288,535	1,540,741	240,126	303,227	25,796	590,845	42,780	1,203,441	78.10	337,300	221,499	205,448	130,411
	7 mos.	1,380	8,936,736	2,113,117	11,696,637	1,793,488	2,110,579	168,149	4,568,539	304,060	8,946,792	76.50	2,749,845	1,941,481	1,848,546	378,889
Illinois Central Combined Report	July	6,227	9,881,433	2,307,598	13,050,691	1,895,876	3,378,863	220,369	4,677,991	357,225	10,580,682	81.10	2,470,009	1,616,066	1,716,133	1,507,323
	7 mos.	6,227	74,468,286	17,096,794	98,650,779	12,951,106	22,498,278	1,560,708	37,367,283	2,533,824	77,173,672	78.20	21,477,107	14,876,233	15,685,013	14,459,945
International Great Northern	July	1,159	855,715	219,006	1,166,662	252,284	250,540	35,087	446,072	50,721	1,011,616	86.70	155,046	119,227	98,358	117,144
	7 mos.	1,159	6,461,888	1,471,528	8,852,574	1,787,096	1,750,608	247,413	3,506,313	346,400	7,529,456	85.05	1,323,118	1,077,352	713,965	662,238
Kansas City, Mexico & Orient	July	272	200,377	10,050	218,774	37,428	36,954	7,020	73,886	9,016	164,304	75.10	54,470	44,373	18,513	30,136
	7 mos.	272	1,028,229	54,732	1,132,099	231,313	256,959	36,279	496,174	43,575	1,064,255	94.00	67,844	18,806	—91,235	—44,002
Kans. City, Mex. & Orient of Tex.	July	465	183,771	13,432	203,134	50,333	31,399	7,103	62,471	9,733	160,823	79.20	42,311	35,311	16,081	24,491
	7 mos.	465	1,074,836	78,857	1,197,480	271,877	232,726	39,541	481,909	44,880	1,070,441	89.40	127,039	92,791	—7,944	—197,823
Kansas City Southern	July	767	1,096,908	169,699	1,397,286	194,245	291,538	43,369	479,640	74,173	1,081,270	77.40	316,016	231,923	227,145	216,403
	7 mos.	767	8,285,224	1,127,755	10,359,998	1,550,833	1,997,114	289,999	3,544,213	524,993	7,897,542	76.20	2,462,456	1,837,396	1,599,848	1,801,267
Texarkana & Ft. Smith	July	81	209,925	13,358	238,943	24,296	13,875	5,431	59,157	9,572	113,244	47.40	125,699	110,328	83,025	64,610
	7 mos.	81	1,429,189	99,130	651,626	148,581	148,922	35,591	434,645	67,682	845,513	51.20	806,113	697,776	531,478	482,271
Kansas, Oklahoma & Gulf	July	314	143,950	9,070	158,647	42,967	20,264	7,561	64,220	9,034	144,129	90.90	14,518	4,228	705	—13,053
	7 mos.	314	1,060,185	68,124	1,170,038	285,198	210,249	56,411	475,354	80,067	1,107,556	94.70	62,502	—8,520	—57,046	82,549
Lake Superior & Ishpeming	July	162	215,765	2,928	250,538	45,693	22,695	523	67,108	6,018	142,037	56.70	108,501	105,506	104,303	179,059
	7 mos.	162	855,102	35,586	995,222	257,761	166,919	3,856	312,975	38,671	780,182	78.30	215,040	121,926	103,218	272,153

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1924—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1923.
Lake Terminal	July	10	.....	.....	$94,254	$25,628	$16,672	.....	$63,283	$1,635	$107,218	113.80	—$12,964	—$19,369	—$16,521	—$3,366
	7 mos.	10	.....	.....	611,327	118,907	122,677	.....	394,596	12,897	649,077	106.20	—37,750	—82,582	—91,699	38,876
Lehigh & Hudson River	July	96	$250,093	$3,254	262,744	39,623	41,316	$1,856	92,354	9,869	184,897	70.40	77,847	65,333	40,897	56,759
	7 mos.	96	1,742,350	21,007	1,838,502	221,165	308,847	11,910	681,657	74,911	1,298,369	70.60	540,133	443,367	274,512	434,294
Lehigh & New England	July	219	463,620	1,513	473,473	53,188	104,451	4,777	147,552	20,693	330,661	69.80	142,812	121,403	125,328	169,157
	7 mos.	219	2,909,162	11,620	2,980,765	388,712	814,420	44,016	966,866	130,820	2,344,562	78.70	636,203	526,236	583,206	948,131
Lehigh Valley	July	1,374	5,302,537	764,918	6,501,808	812,185	1,406,156	123,664	2,370,239	136,300	4,877,890	75.00	1,623,918	1,291,171	1,258,185	848,660
	7 mos.	1,374	36,580,695	4,197,355	43,822,538	4,571,760	10,939,877	799,208	17,868,694	960,063	35,322,050	80.60	8,500,488	6,799,898	6,385,230	1,480,380
Los Angeles & Salt Lake	July	1,209	1,174,524	510,883	1,877,115	392,882	427,231	57,477	639,485	68,268	1,662,438	88.60	214,677	70,247	—27,370	144,042
	7 mos.	1,209	9,582,485	3,472,819	14,336,105	2,746,997	2,927,090	429,320	4,593,737	431,789	11,579,824	80.80	2,756,281	1,854,549	1,327,690	1,605,063
Louisiana & Arkansas	July	302	299,226	33,680	342,047	65,199	78,236	8,760	93,521	12,549	257,448	75.30	84,599	60,761	46,488	30,635
	7 mos.	302	1,964,519	242,009	2,268,467	398,755	509,278	61,643	657,824	81,705	1,705,941	75.20	562,526	406,041	320,857	526,714
Louisiana Ry. & Nav. Co	July	337	324,189	21,854	361,278	93,879	68,493	9,981	138,155	10,055	318,879	88.20	42,399	23,720	—13,838	—930
	7 mos.	337	1,924,988	165,573	2,212,963	549,569	367,980	74,477	936,615	77,269	1,999,592	90.40	213,371	86,643	—109,202	26,765
Louisiana Ry. & Nav. Co. of Tex.	July	206	79,179	12,213	97,745	19,880	11,807	3,315	49,549	4,846	89,397	91.50	8,348	4,334	—11,995	—11,270
	7 mos.	206	579,933	81,561	713,714	139,962	112,303	23,599	358,203	33,774	667,811	93.60	45,903	17,882	—106,612	—57,095
Louisville & Nashville	July	5,042	7,835,249	2,051,072	10,491,718	1,540,114	2,402,185	208,565	3,789,067	250,238	8,225,357	78.40	2,266,361	1,727,494	1,727,399	1,682,611
	7 mos.	5,042	57,624,659	14,018,938	76,520,003	11,370,123	19,121,612	1,606,946	29,359,862	1,809,733	63,474,461	83.00	13,045,542	10,051,285	10,190,748	12,416,930
Louisville, Henderson & St. Louis	July	199	172,749	59,297	247,583	58,039	38,393	6,935	91,996	9,209	204,572	82.60	43,011	27,776	26,005	25,736
	7 mos.	199	1,409,904	422,444	1,958,752	444,503	297,281	48,425	708,050	66,071	1,564,330	79.90	394,422	315,312	247,324	360,241
Maine Central	July	1,207	1,077,431	441,546	1,678,053	288,017	280,085	17,272	721,034	49,169	1,360,813	81.10	317,240	214,648	218,945	274,446
	7 mos.	1,207	8,432,670	2,571,799	11,988,891	1,906,066	2,400,173	98,968	5,101,591	348,077	9,862,006	82.30	2,126,885	1,409,588	1,367,824	774,714
Midland Valley	July	365	274,953	46,572	339,648	81,022	53,669	6,378	96,005	18,999	253,067	74.50	86,581	68,171	53,496	96,004
	7 mos.	365	2,088,644	384,970	2,574,335	488,917	363,865	42,340	752,184	120,775	1,750,137	68.00	824,198	701,915	599,050	683,847
Minneapolis & St. Louis	July	1,649	945,372	103,394	1,118,860	396,583	341,595	28,601	550,297	45,524	1,362,723	121.80	—244,043	—272,986	—343,804	—69,607
	7 mos.	1,649	6,763,948	867,524	8,124,600	1,931,782	2,240,207	195,328	3,885,018	313,833	8,564,037	105.40	—439,437	—862,201	—1,254,229	462,011
Minneapolis, St. Paul & S. S. Marie	July	4,402	2,778,572	665,970	3,833,750	691,828	724,450	66,254	1,425,997	107,242	3,043,747	79.40	790,003	546,744	454,653	1,025,279
	7 mos.	4,402	18,603,195	3,868,958	24,738,331	4,087,104	4,942,787	452,181	10,628,384	786,381	21,024,100	85.00	3,714,231	2,080,510	1,701,605	3,974,934
Mississippi Central	July	257	123,714	17,419	145,544	34,137	25,183	6,789	40,274	9,320	115,703	79.50	29,841	22,332	30,385	—1,035
	7 mos.	257	906,647	107,384	1,047,701	201,947	172,953	42,936	299,438	56,599	773,869	73.90	273,832	224,648	259,977	151,638
Missouri & North Arkansas	July	364	85,003	22,119	117,251	29,727	20,472	4,829	48,557	7,545	111,133	94.80	6,118	2,986	—3,192	27,254
	7 mos.	364	660,689	134,395	856,049	199,574	164,178	31,816	361,531	51,835	808,880	94.50	47,169	24,395	—23,871	39,816
Missouri-Kansas-Texas	July	1,799	2,149,726	449,955	2,763,172	423,677	573,769	54,129	753,162	91,238	1,908,476	69.10	854,696	649,254	622,221	780,607
	7 mos.	1,807	13,754,577	3,137,673	18,324,240	2,055,727	4,282,835	360,547	5,261,719	644,477	12,693,251	69.30	5,630,989	4,374,206	4,684,100	4,615,334
Missouri-Kansas-Texas of Texas	July	1,389	1,232,991	404,964	1,754,273	256,440	317,252	40,772	631,057	66,752	1,324,363	75.50	429,910	381,964	248,466	160,999
	7 mos.	1,389	7,176,052	2,821,467	11,015,516	1,683,751	1,805,555	284,407	4,356,396	468,619	8,646,141	78.50	2,369,375	2,022,061	910,454	—72,811
Missouri Pacific	July	7,361	7,570,380	1,591,244	9,943,564	1,738,713	2,015,791	253,056	3,617,356	305,006	7,910,495	79.60	2,033,069	1,658,115	1,269,335	829,078
	7 mos.	7,361	50,768,320	10,232,376	66,826,020	10,177,679	14,725,031	1,459,813	25,729,506	2,134,875	54,594,486	81.70	12,231,534	9,590,432	7,560,576	4,087,621
Mobile & Ohio	July	1,165	1,219,090	149,471	1,452,490	222,779	230,307	48,936	523,263	48,929	1,074,008	73.90	378,482	291,956	259,889	214,267
	7 mos.	1,165	9,734,966	1,080,530	11,449,447	1,600,657	2,021,667	331,196	4,028,679	332,673	8,315,337	72.60	3,134,110	2,532,821	2,147,045	1,873,459
Monongahela	July	106	304,428	24,272	333,277	55,000	45,000	1,074	94,939	9,016	204,726	61.40	128,551	118,051	74,154	71,547
	7 mos.	106	2,422,560	203,685	2,657,958	385,000	559,758	7,470	801,542	68,676	1,824,802	68.70	833,156	759,134	342,263	541,041
Monongahela Connecting	July	7	.....	.....	103,732	15,526	25,682	375	57,712	17,549	116,844	112.60	—13,112	—17,803	—19,183	23,519
	7 mos.	7	.....	.....	1,202,520	150,444	287,601	2,654	638,414	43,970	1,123,083	93.40	79,437	43,602	—10,819	119,916
Montour	July	57	148,602	629	150,901	34,091	49,659	1,021	29,070	7,335	121,176	80.30	29,725	20,988	55,746	93,770
	7 mos.	57	865,478	6,809	883,538	184,768	331,822	7,040	242,687	51,005	817,322	92.50	66,216	23,788	253,329	612,682
Nashville, Chattanooga & St. Louis	July	1,258	1,432,077	405,861	1,953,459	259,588	409,771	76,064	692,745	64,069	1,506,036	77.10	447,423	386,957	391,121	107,885
	7 mos.	1,258	9,910,610	2,828,219	13,731,636	2,062,062	3,216,199	537,838	5,271,339	475,219	11,584,211	84.40	2,147,425	1,724,981	1,668,759	2,006,256
Nevada Northern	July	165	82,184	10,542	99,050	18,253	9,465	935	14,551	4,546	47,750	48.20	51,300	45,356	44,414	46,806
	7 mos.	165	510,117	68,558	615,494	98,994	58,242	6,356	114,710	31,245	309,547	50.30	305,947	258,657	256,737	246,768
Newburgh & South Shore	July	7	.....	.....	149,802	37,753	44,461	.....	58,477	4,521	145,390	97.00	4,412	—7,996	—8,001	7,235
	7 mos.	7	.....	.....	1,154,823	189,753	369,957	.....	475,914	28,490	1,068,796	92.60	86,027	—8,185	23,094	44,957
New Orleans Great Northern	July	274	191,573	34,591	234,586	42,069	35,739	5,602	74,876	11,015	169,778	72.40	64,808	46,380	38,444	56,839
	7 mos.	274	1,444,030	212,156	1,720,411	268,123	293,576	38,219	537,418	77,449	1,218,299	70.80	502,112	378,097	302,007	434,144
New York Central	July	6,889	16,873,998	9,019,162	29,523,337	4,068,739	5,941,146	366,474	10,418,347	856,243	22,023,652	74.60	7,499,685	5,561,561	5,143,937	7,604,678
	7 mos.	6,889	130,732,343	55,255,520	212,657,063	25,288,695	44,948,746	2,484,971	79,504,451	6,288,556	161,040,867	75.70	51,616,198	37,785,178	35,975,023	47,452,912
Cincinnati Northern	July	244	317,772	12,307	337,899	60,555	56,147	6,355	121,785	8,679	250,863	74.20	87,036	70,817	34,614	81,346
	7 mos.	244	2,558,076	79,079	2,690,841	384,050	459,510	39,295	946,331	61,380	1,887,994	70.20	802,847	671,568	364,722	533,482
Cleve., Cin., Chicago & St. Louis	July	2,411	4,829,470	1,421,620	6,759,531	1,097,207	1,617,183	123,959	2,430,631	189,041	5,514,917	81.60	1,244,614	900,557	780,415	1,459,363
	7 mos.	2,409	35,639,614	9,665,757	49,383,306	6,129,036	11,106,241	812,372	19,048,635	1,370,875	38,696,440	78.40	10,686,866	8,052,832	6,831,744	10,865,204
Indiana Harbor Belt	July	119	.....	.....	811,335	167,361	138,397	4,690	323,640	21,991	654,577	80.70	156,758	138,137	19,079	145,840
	7 mos.	119	.....	.....	6,193,808	834,842	865,842	32,320	2,833,558	163,273	4,723,480	76.30	1,470,328	1,289,031	447,733	997,453
Michigan Central	July	1,862	4,475,384	1,997,121	7,097,847	934,814	1,282,884	104,059	2,369,948	151,911	4,927,370	69.40	2,170,477	1,697,374	1,600,615	1,915,662
	7 mos.	1,862	34,332,536	12,075,394	51,299,331	6,024,199	10,204,509	716,313	18,091,981	1,112,589	36,656,222	71.50	14,643,109	11,536,037	10,849,840	13,444,390
Pittsburgh & Salt Lake	July	231	1,900,703	280,415	2,272,047	399,923	786,017	23,357	741,196	67,359	2,021,663	88.00	250,384	114,588	435,902	1,365,415
	7 mos.	233	16,197,733	1,807,535	18,731,986	2,413,417	5,752,407	175,413	6,147,522	500,300	14,995,825	80.10	3,736,161	2,625,911	4,892,054	10,277,636
New York, Chicago & St. Louis	July	1,695	3,647,775	219,393	4,016,166	627,491	771,215	121,489	1,479,020	148,238	3,152,729	78.50	863,437	636,664	499,325	803,974
	7 mos.	1,695	28,621,894	1,186,060	30,965,027	4,218,164	5,919,917	833,243	11,794,077	1,080,793	23,875,294	77.10	7,089,733	5,461,141	4,471,256	6,563,126

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1924—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1923.
New York, New Haven & Hartford	July	1,986	$5,522,151	$4,332,160	$10,877,095	$1,830,690	$2,223,381	$75,500	$3,925,854	$296,685	$8,507,586	78.20	$2,369,509	$1,964,605	$1,437,013	$1,693,147
	7 mos.	1,992	36,835,327	28,366,737	73,357,035	9,517,727	16,245,963	447,418	28,032,248	1,990,520	57,305,532	78.10	16,051,503	13,189,499	10,254,084	5,624,176
Central New England	July	295	668,241	13,059	701,880	139,783	128,888	5,080	213,048	14,248	501,047	71.40	200,833	175,078	124,023	214,793
	7 mos.	295	4,472,608	90,365	4,715,498	776,725	891,460	35,440	1,575,636	82,178	3,359,439	71.20	1,356,059	1,175,882	941,034	346,989
New York Connecting	July	20	188,200	.....	207,994	18,531	15,186	.....	43,192	1,657	78,566	37.80	129,428	88,678	49,631	116,002
	7 mos.	20	1,266,484	.....	1,628,550	67,184	100,821	.....	327,345	9,495	504,845	31.00	1,123,705	857,355	603,907	1,037,010
New York, Ontario & Western	July	569	767,541	667,009	1,639,161	247,315	232,959	16,458	553,994	35,491	1,088,538	66.40	550,623	502,575	447,213	443,612
	7 mos.	569	4,969,047	1,474,940	7,583,221	1,035,125	1,446,451	109,658	3,460,592	250,781	6,311,564	83.20	—1,271,657	935,100	672,307	392,943
Norfolk & Western	July	2,240	6,049,139	782,256	7,132,821	1,270,833	1,601,719	87,127	2,238,191	158,602	5,349,590	75.00	1,783,231	1,107,844	1,271,047	1,872,201
	7 mos.	2,240	44,993,487	5,211,893	52,436,229	8,539,527	13,018,518	598,523	17,100,824	1,176,993	40,492,538	77.20	11,943,691	7,513,598	8,458,166	10,764,834
Norfolk Southern	July	931	557,255	135,478	736,191	110,004	121,604	23,671	299,437	29,500	584,339	79.40	151,852	108,629	83,488	83,159
	7 mos.	931	4,586,457	730,889	5,637,294	758,334	855,705	171,648	2,213,431	203,002	4,205,383	74.60	1,431,911	1,128,135	826,195	674,600
Northern Pacific	July	6,669	5,206,142	1,328,366	7,299,929	1,315,661	1,411,334	166,993	2,651,754	225,447	5,854,967	80.20	1,444,962	760,254	1,068,232	609,319
	7 mos.	6,669	37,068,882	7,866,445	49,907,377	7,857,529	11,512,276	1,164,988	19,100,250	1,591,778	41,526,463	83.20	8,380,914	3,640,883	6,256,747	4,530,962
Northwestern Pacific	July	480	411,478	283,406	772,577	91,221	83,418	7,053	236,861	18,125	430,449	55.70	342,128	295,901	284,003	323,080
	7 mos.	494	2,172,674	1,416,378	4,006,584	729,127	643,714	47,662	1,532,336	125,163	3,069,698	76.60	936,886	617,684	559,862	721,825
Pennsylvania R. R.	July	10,508	36,068,605	12,487,875	53,049,271	7,043,987	12,679,185	703,765	20,157,269	1,400,354	42,746,633	80.60	10,302,638	7,013,693	5,427,428	7,538,566
	7 mos.	10,508	251,618,623	85,015,024	368,986,630	38,576,834	92,187,659	4,545,568	146,917,205	9,979,553	297,572,584	80.60	71,414,046	54,235,266	42,752,683	48,973,035
Baltimore, Chesapeake & Atlantic	July	125	131,590	60,784	197,962	22,776	15,608	3,092	103,107	3,206	147,789	74.60	50,173	37,865	39,372	1,272
	7 mos.	103	571,043	212,945	815,952	86,923	197,189	13,979	533,974	25,342	857,407	105.10	—41,475	—65,201	—68,291	—198,516
Long Island	July	397	812,863	2,652,921	3,708,502	489,144	475,084	22,760	1,287,241	65,060	2,350,340	63.40	1,358,162	1,014,643	628,563	755,126
	7 mos.	397	5,878,399	12,372,485	19,788,671	2,610,355	3,391,763	152,458	8,848,739	456,850	15,544,165	78.60	4,244,506	3,205,827	1,962,584	2,079,634
West Jersey & Seashore	July	360	386,543	1,064,008	1,525,228	217,427	220,145	19,056	567,264	27,042	1,051,525	68.90	473,693	257,397	228,534	319,692
	7 mos.	360	2,406,235	4,108,942	7,017,592	1,080,347	1,346,541	96,393	3,348,168	172,161	6,073,245	86.50	944,347	520,608	342,471	516,209
Peoria & Pekin Union	July	19	20,546	2,297	121,508	30,367	14,772	791	56,423	8,208	110,561	91.00	10,947	—1,553	23,386	29,689
	7 mos.	19	171,196	17,222	1,012,686	140,843	104,942	5,051	473,306	55,549	779,691	77.00	232,995	145,495	307,068	317,756
Pere Marquette	July	2,292	2,673,988	515,164	3,448,727	422,636	610,500	50,773	1,162,040	103,174	2,346,760	68.00	1,101,967	943,473	780,081	442,056
	7 mos.	2,292	18,743,112	2,950,594	23,769,976	3,065,187	5,087,849	364,933	9,196,000	739,167	18,401,071	77.40	5,368,905	4,258,838	3,289,188	3,893,867
Pittsburg & Shawmut	July	102	87,740	2,859	94,919	19,381	28,591	1,325	28,355	7,397	85,049	89.60	9,870	6,422	14,452	22,507
	7 mos.	102	554,260	37,743	608,990	132,213	249,490	10,465	210,538	50,282	652,988	107.20	—43,998	—48,853	48,866	226,039
Pittsburgh & West Virginia	July	92	288,087	7,880	330,647	47,415	80,621	4,669	66,962	17,145	228,982	69.30	101,665	59,052	129,084	83,700
	7 mos.	92	1,935,540	60,789	2,237,808	268,779	631,563	32,337	499,237	112,064	1,644,303	73.50	593,505	323,449	803,573	782,695
Pittsburgh, Shawmut & Northern	July	210	109,029	2,590	113,954	31,254	28,797	1,882	44,300	4,961	111,194	97.50	2,760	124	—4,749	—18,184
	7 mos.	210	702,824	38,595	771,364	172,196	226,943	11,688	336,340	40,958	788,125	102.20	—16,761	—35,637	—67,603	58,274
Quincy, Omaha & Kansas City	July	250	47,310	17,850	73,335	35,873	14,148	1,335	39,477	3,608	94,334	128.60	—20,999	—25,731	—29,292	—28,504
	7 mos.	250	375,659	153,429	586,369	211,234	113,960	6,775	300,073	20,510	650,745	111.05	—64,376	—92,994	—113,760	—178,090
Reading Company	July	1,148	5,878,067	860,135	7,047,233	838,090	1,683,707	68,630	2,611,727	168,407	5,380,547	76.30	1,666,686	1,366,274	1,494,779	2,335,909
	7 mos.	1,149	45,081,243	5,915,728	53,409,522	6,343,057	13,273,392	512,176	20,197,931	1,398,558	41,787,539	78.20	11,621,983	9,048,529	9,990,344	20,660,882
Atlantic City	July	169	113,684	542,826	679,190	60,741	35,445	10,132	269,607	4,197	380,203	56.00	298,987	279,038	239,856	262,507
	7 mos.	169	811,312	1,567,690	2,496,643	663,221	223,131	64,127	1,395,275	35,699	2,382,035	95.40	114,608	—25,350	—205,481	—24,193
Perkiomen	July	41	98,298	8,463	109,745	8,225	4,805	106	41,451	814	55,438	50.50	54,307	44,135	37,541	29,186
	7 mos.	41	622,548	42,626	690,752	57,173	36,252	756	302,820	5,588	402,840	58.30	287,912	255,273	218,774	173,152
Port Reading	July	21	148,714	.....	179,986	21,630	22,902	229	60,119	2,316	107,163	59.50	72,823	60,191	7,235	20,465
	7 mos.	21	926,673	.....	1,168,947	158,462	65,692	1,603	504,509	15,815	746,043	63.80	422,904	324,445	—1,355	311,160
Richm'd, Fredericksburg & Potomac	July	117	577,554	267,710	977,435	115,358	157,138	8,517	338,858	32,377	659,196	68.50	308,239	254,711	203,787	215,456
	7 mos.	117	3,673,103	2,430,575	7,261,086	831,699	1,075,963	63,623	2,415,854	230,921	4,781,477	65.90	2,479,609	2,077,422	1,637,174	1,821,925
Rutland	July	413	302,884	134,753	564,655	117,457	103,850	9,248	212,859	12,849	457,987	81.10	106,668	77,850	80,095	77,201
	7 mos.	413	2,180,462	827,488	3,793,644	698,129	714,544	61,881	1,578,873	93,121	3,157,694	83.20	635,950	443,948	477,337	492,325
St. Louis-San Francisco	July	4,747	5,029,641	1,526,681	7,901,867	938,900	1,411,956	101,254	2,315,767	191,631	4,953,450	70.70	2,048,417	1,683,627	1,615,973	1,453,686
	7 mos.	4,747	32,984,537	10,406,469	46,821,959	5,820,414	9,675,153	680,446	16,603,291	1,393,578	34,044,577	72.70	12,777,382	10,438,052	10,430,954	10,642,253
Ft. Worth & Rio Grande	July	235	98,102	24,299	133,187	20,254	24,393	3,675	55,197	5,983	109,496	82.26	23,691	19,854	10,388	—4,666
	7 mos.	235	614,685	174,822	870,582	144,241	167,234	28,017	401,236	42,120	782,716	89.90	87,866	60,740	—3,309	—104,511
St. Louis, San Francisco & Texas	July	134	140,930	12,354	159,034	24,208	23,776	4,486	58,283	6,783	117,524	73.90	41,510	39,405	18,722	8,994
	7 mos.	134	840,185	92,300	980,533	148,862	172,095	33,597	389,696	45,487	789,555	80.50	190,978	175,847	24,780	—89,763
St. Louis Southwestern	July	969	1,083,142	140,096	1,291,134	182,262	237,027	51,185	341,775	61,229	886,950	68.70	404,184	334,688	287,522	472,045
	7 mos.	969	8,396,852	1,018,225	9,943,125	1,288,266	2,196,471	332,961	2,652,324	412,083	6,980,856	70.20	2,962,269	2,526,496	2,046,731	3,522,453
St. Louis Southwestern of Texas	July	807	477,330	85,049	608,275	150,501	136,554	24,559	247,732	30,058	590,138	97.00	18,137	—8,491	41,450	9,794
	7 mos.	807	3,238,670	614,628	4,204,396	984,901	1,196,521	153,523	1,780,095	212,113	4,355,218	103.60	—150,822	—331,959	—36,329	—917,813
San Antonio & Aransas Pass	July	739	469,829	74,367	577,002	138,834	123,907	11,204	209,694	23,602	505,443	87.60	71,559	54,598	32,832	36,896
	7 mos.	739	3,005,763	478,389	3,723,037	854,747	856,181	78,520	1,473,886	154,872	3,402,403	91.40	320,634	204,398	118,278	—185,761
San Antonio, Uvalde & Gulf	July	317	85,085	20,122	116,500	18,094	14,948	4,192	55,671	5,856	98,419	84.50	18,081	14,484	4,168	14,117
	7 mos.	317	691,479	137,371	903,919	164,296	105,103	30,871	384,039	42,508	726,475	80.40	177,444	153,530	63,640	26,970
Seaboard Air Line	July	3,570	2,768,889	664,528	3,734,115	573,384	578,146	150,269	1,494,143	168,507	2,995,933	80.20	738,182	545,765	564,187	632,597
	7 mos.	3,571	22,483,898	5,751,910	31,294,414	4,353,459	5,437,527	1,007,438	11,976,043	1,186,755	24,270,586	77.60	7,023,828	5,685,841	5,192,517	4,134,223
Southern Ry.	July	6,868	7,676,076	2,702,754	11,233,683	1,657,232	2,166,823	221,412	3,989,221	332,539	8,443,402	75.20	2,790,281	2,173,782	2,105,215	2,033,998
	7 mos.	6,868	56,393,708	17,905,522	80,853,264	11,458,499	14,792,017	1,561,035	30,019,531	2,244,975	60,633,509	75.00	20,219,665	16,135,561	14,858,372	15,466,476
Alabama Great Southern	July	318	522,569	191,135	762,495	136,181	170,968	19,904	247,790	24,838	606,987	79.60	155,508	105,585	158,660	197,625
	7 mos.	318	4,165,482	1,170,940	5,680,240	847,568	1,300,413	144,532	1,869,565	169,300	4,377,714	77.10	1,302,526	1,027,059	1,204,146	1,512,592

REVENUES AND EXPENSES OF RAILWAYS

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1924—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1923.
Cin., New Orleans & Tex. Pacific.	July	338	$1,365,470	$311,246	$1,765,767	$279,640	$350,982	$38,980	$531,022	$48,718	$1,260,264	71.40	$505,503	$426,324	$428,849	$291,206
	7 mos.	338	9,616,184	2,418,251	12,692,013	1,946,347	2,641,161	276,804	3,832,523	331,140	9,114,707	71.80	3,577,306	3,073,991	2,929,173	2,906,209
Georgia, Southern & Florida	July	401	303,534	102,502	436,501	70,120	53,780	9,158	158,588	11,457	305,163	69.90	131,338	112,387	71,218	33,559
	7 mos.	401	1,866,046	763,213	2,848,332	493,374	388,205	68,933	1,085,408	75,621	2,132,737	74.90	715,595	584,634	299,276	299,246
New Orleans & Northeastern	July	207	305,557	90,526	428,528	56,069	77,394	10,465	132,448	16,289	296,798	69.30	131,730	94,204	103,042	49,428
	7 mos.	207	2,405,118	583,160	3,224,775	470,753	611,893	82,160	997,543	107,554	2,296,812	71.20	927,963	661,862	663,832	585,552
Northern Alabama	July	110	86,605	11,701	101,132	22,042	5,307	2,275	34,206	3,111	66,936	66.20	34,196	29,641	2,442	23,049
	7 mos.	110	762,699	90,939	875,425	141,760	40,630	16,911	290,467	22,825	512,587	58.50	362,838	318,060	131,473	188,517
Southern Pacific	July	7,199	10,687,169	3,739,233	16,088,435	2,097,342	2,510,139	311,333	5,446,677	495,965	11,057,086	68.70	5,031,349	3,696,320	3,485,085	4,110,343
	7 mos.	7,162	71,090,350	25,097,514	107,291,919	15,346,666	18,342,705	2,024,468	36,970,548	3,508,098	77,749,729	72.50	29,542,190	20,739,353	19,524,967	22,588,081
Arizona Eastern	July	382	260,297	19,578	291,773	40,296	45,076	3,567	87,597	20,822	198,256	68.00	93,517	66,528	60,149	68,905
	7 mos.	382	1,716,512	178,559	1,997,273	333,507	303,891	24,133	644,769	145,147	1,459,054	73.10	538,219	348,806	310,941	604,940
Atlantic Steamship Lines	July	...	691,497	57,327	883,021	29,917	233,850	17,173	633,328	30,096	944,364	106.90	—61,343	—72,947	—72,947	200,571
	7 mos.	...	5,835,616	374,304	6,688,312	145,506	1,449,268	140,961	4,703,818	218,456	6,658,009	99.50	30,303	—52,445	—54,266	1,436,708
Galveston, Harrisb. & San Antonio.	July	1,379	1,683,995	400,808	2,205,445	296,343	376,030	39,568	719,442	87,570	1,531,093	69.40	674,352	590,000	512,507	77,535
	7 mos.	1,379	10,812,975	2,931,034	14,582,091	2,742,080	2,889,439	305,463	5,124,214	608,984	11,747,063	80.60	2,835,028	2,346,342	1,940,307	745,953
Houston & Texas Central	July	923	786,653	257,157	1,112,314	187,853	200,273	24,976	389,592	43,487	845,196	76.00	267,118	220,441	186,269	128,142
	7 mos.	923	5,680,693	1,773,808	7,980,142	2,066,621	1,617,392	180,320	2,856,307	297,359	7,007,541	87.80	972,601	668,000	342,775	214,580
Houston, East & West Texas	July	191	202,144	49,144	261,822	79,491	53,624	3,786	86,428	8,308	231,593	88.50	30,229	19,531	6,451	28,702
	7 mos.	191	1,364,314	304,714	1,762,781	563,255	416,928	25,971	689,526	57,427	1,746,433	99.10	16,348	—29,899	—110,591	—12,748
Louisiana Western	July	207	203,359	88,464	314,247	30,892	65,349	10,684	101,069	18,047	229,569	73.10	84,678	58,825	66,520	89,103
	7 mos.	207	1,544,260	599,026	2,325,188	360,403	484,110	82,029	718,535	127,108	1,798,242	77.30	526,946	335,451	352,832	524,564
Morgan's L. & T. R. R. & S. S. Co.	July	400	427,968	142,085	617,601	111,696	137,314	16,943	267,632	34,799	568,742	92.10	48,859	634	—21,854	—40,522
	7 mos.	400	3,184,427	992,647	4,548,521	1,102,484	1,105,245	131,025	1,961,852	250,077	4,553,914	100.10	—5,393	—343,236	—483,662	—49,798
Texas & New Orleans	July	507	575,403	155,595	776,282	124,296	153,065	11,316	254,293	26,122	565,046	72.80	211,236	175,803	157,561	26,124
	7 mos.	507	3,749,814	1,115,299	5,228,649	1,479,774	1,252,280	88,751	1,980,241	192,114	4,836,607	92.50	392,042	180,994	—101,413	61,475
Spokane International	July	165	73,649	16,598	95,302	21,664	7,465	3,163	32,983	6,395	72,521	76.10	22,781	17,152	11,228	4,959
	7 mos.	165	518,245	110,982	666,414	112,487	61,997	23,083	233,184	43,170	479,164	71.90	187,250	147,162	100,402	74,884
Spokane, Portland & Seattle	July	554	411,823	151,423	628,843	102,364	98,158	10,984	200,156	18,425	438,435	69.70	190,408	121,216	123,150	113,832
	7 mos.	554	3,295,127	892,641	4,610,899	549,625	861,283	68,260	1,401,448	127,233	3,001,873	65.10	1,609,026	1,118,068	1,033,963	822,933
Tennessee Central	July	296	169,141	46,170	229,788	51,209	37,190	6,764	86,913	10,049	192,125	83.60	37,663	33,904	17,756	24,302
	7 mos.	296	1,191,218	292,353	1,589,930	260,104	233,104	46,070	601,830	70,584	1,211,445	76.20	378,485	330,064	240,912	245,172
Terminal Railroad Assoc. of St. L.	July	37	.....	.....	392,612	91,196	51,866	917	134,498	8,071	289,776	73.80	102,836	45,296	122,417	185,845
	7 mos.	37	.....	.....	2,879,313	652,153	322,613	6,935	1,078,559	61,631	2,144,717	74.50	734,596	316,799	953,621	1,354,782
East St. Louis Connecting	July	1	.....	.....	159,946	26,239	14,456	262	56,750	2,256	99,963	62.50	59,983	56,793	39,123	66,540
	7 mos.	1	.....	.....	1,275,782	135,065	95,444	1,983	493,067	17,149	742,708	58.20	533,074	481,939	332,585	533,500
St. L. Merchants' Bridge Term.	July	9	.....	.....	322,664	104,442	32,112	845	153,745	6,604	297,748	92.30	24,915	6,009	18,743	100,955
	7 mos.	9	.....	.....	2,580,980	521,856	216,379	6,400	1,326,350	49,626	2,120,611	82.20	460,369	292,887	315,686	703,617
St. Louis Transfer Ry	July	6	.....	.....	58,051	11,940	6,915	153	37,444	1,206	57,658	99.30	393	136	—5,074	14,626
	7 mos.	6	.....	.....	463,151	71,458	48,615	1,153	282,075	8,888	412,189	89.00	50,962	49,838	5,340	107,982
Texas & Pacific Ry	July	1,952	1,923,856	553,322	2,671,922	411,107	551,850	60,851	902,600	415,318	2,336,250	87.40	335,672	183,169	136,943	391,002
	7 mos.	1,952	12,653,542	3,931,475	18,063,457	2,813,638	3,770,349	399,702	6,436,775	1,270,842	14,713,561	81.50	3,349,896	2,317,393	1,898,478	1,219,480
Toledo, Peoria & Western	July	247	107,588	29,500	153,041	28,582	35,857	2,467	72,993	7,269	147,168	96.20	5,873	—5,627	—16,920	—26,284
	7 mos.	247	741,978	279,245	1,118,563	157,949	246,525	15,706	508,998	49,798	978,581	87.50	140,012	62,452	—231	—152,238
Trinity & Brazos Valley	July	368	122,012	18,693	146,570	36,919	35,214	3,754	59,721	11,099	144,758	98.80	1,812	—5,305	—16,560	123,505
	7 mos.	368	927,685	135,266	1,115,125	402,576	375,065	23,338	543,209	82,355	1,421,768	127.50	—306,643	—357,050	—479,359	—56,446
Ulster & Delaware	July	128	65,009	95,154	200,097	28,517	14,821	2,014	78,209	6,643	130,204	65.00	69,893	64,393	57,494	52,894
	7 mos.	128	423,653	192,433	853,667	140,591	123,271	13,122	413,385	47,410	737,779	86.40	115,888	77,307	44,365	81,947
Union Railroad of Penna.	July	45	.....	.....	906,105	123,639	265,593	316	366,957	8,872	765,377	84.50	140,728	129,228	190,973	367,313
	7 mos.	45	.....	.....	6,342,851	796,747	2,201,059	1,563	3,025,234	59,413	6,083,924	95.90	258,927	169,062	690,671	2,099,384
Union Pacific	July	3,716	6,206,817	1,669,967	8,726,887	1,532,276	1,740,575	177,529	2,466,181	276,495	6,414,776	73.50	2,312,111	1,576,193	1,315,183	1,394,458
	7 mos.	3,715	41,675,809	10,054,542	57,344,874	7,636,957	12,309,181	1,124,815	16,872,357	1,985,514	41,131,481	71.70	16,213,393	11,522,480	10,822,784	12,433,933
Oregon Short Line	July	2,374	1,993,445	534,388	2,782,525	592,714	505,110	45,090	868,034	105,148	2,185,368	78.50	597,157	315,606	221,868	120,424
	7 mos.	2,367	14,911,310	2,932,450	19,346,670	3,388,802	3,804,774	328,017	6,178,571	774,245	14,872,335	76.90	4,474,335	2,526,732	2,143,046	2,387,820
Oregon, Wash. R. R. & Nav. Co.	July	2,231	1,563,031	461,515	2,248,891	537,616	355,436	63,540	823,750	115,970	1,916,324	85.20	332,567	161,436	42,332	—304,888
	7 mos.	2,231	11,934,871	2,904,234	16,286,420	2,999,703	2,738,145	453,185	5,924,309	817,285	13,119,446	80.60	3,166,974	1,970,258	1,337,527	—868,268
St. Joseph & Grand Island	July	258	209,475	22,763	251,648	61,922	43,443	2,781	99,886	11,826	219,858	87.40	31,790	10,632	—191	—60,395
	7 mos.	258	1,528,595	163,073	1,809,953	356,995	312,755	20,169	751,902	85,048	1,527,576	84.40	282,377	181,202	98,447	—20,487
Utah	July	102	117,098	290	118,305	11,749	38,124	379	28,093	5,842	84,187	71.20	34,118	27,976	26,463	—3,701
	7 mos.	102	804,517	2,642	811,268	111,509	265,856	2,532	190,920	45,058	615,875	75.90	195,393	147,106	94,434	77,228
Virginian	July	545	1,262,551	75,831	1,451,437	242,818	333,438	12,747	383,808	44,597	1,007,747	69.40	443,690	344,869	348,987	547,107
	7 mos.	544	9,421,764	500,187	10,641,764	1,347,135	2,424,268	89,094	3,062,746	216,785	7,098,831	66.70	3,542,933	2,691,668	2,721,246	4,610,345
Wabash	July	2,486	3,906,826	817,723	5,160,942	903,398	755,282	130,734	1,947,754	161,097	3,936,303	76.30	1,224,639	985,838	750,280	633,295
	7 mos.	2,486	28,874,226	5,420,929	37,043,408	5,762,116	6,682,735	944,340	14,831,771	1,131,531	29,537,139	79.70	7,512,269	5,868,747	3,877,323	4,778,053
Western Maryland	July	804	1,289,476	82,808	1,436,219	225,937	306,043	36,971	453,910	42,021	1,077,416	75.00	358,803	288,803	249,027	406,083
	7 mos.	804	10,041,856	480,915	11,061,786	1,545,808	2,404,578	253,875	3,644,148	313,340	8,249,733	74.60	2,812,053	2,242,053	2,037,130	2,676,766
Western Pacific	July	1,042	885,566	230,016	1,296,181	418,499	213,703	37,316	423,670	42,243	1,194,290	92.10	101,791	33,762	88,291	208,872
	7 mos.	1,042	5,441,523	1,203,800	7,264,050	1,822,523	1,454,484	251,557	2,605,503	277,699	6,591,991	90.70	672,059	101,080	600,949	1,222,141
Wheeling & Lake Erie	July	511	1,198,756	59,616	1,366,967	236,728	365,772	24,696	471,633	37,732	1,138,498	83.30	228,469	132,621	134,123	243,949
	7 mos.	511	9,393,053	407,324	10,504,838	1,440,552	2,812,147	178,920	3,640,305	256,621	8,345,593	79.40	2,159,245	1,408,043	1,231,541	1,238,324

North Carolina Stop Law

A proposed amendment to the law of North Carolina which requires automobiles to be stopped before passing over railroads, which came up in a recent special session of the Legislature, was not adopted; and the Secretary of State, replying to inquiries, says that the statute remains in exactly the same form in which it was originally enacted.

The Secretary of State gives out a statement of highway crossing accidents in North Carolina, in each of the last two years, showing a large reduction in the number of persons killed in such accidents. This statement shows:

HIGHWAY CROSSING ACCIDENTS IN NORTH CAROLINA

	1923–24	1922–23
Accidents	235	268
Killed	22	44
Injured	113	145

The months in which these years begin and end are not given; presumably the earlier year ended on the date that the stop law went into effect.

Tool Foremen Meet at Chicago

The twelfth annual convention of the American Railway Tool Foremen's Association was held at the Hotel Sherman, Chicago, on September 3, 4 and 5. The convention was called to order by President G. W. Smith, Chesapeake & Ohio, Huntington, W. Va., and the principal address, by J. A. Anderson, superintendent of shops, Chicago, Milwaukee & St. Paul, was a forceful appeal to the tool foreman on American railroads to make an intensive study of their work with the idea of producing more efficient toolroom methods, jigs and fixtures. In this way locomotive and car repair work will be speeded up and its cost reduced. Mr. Anderson stressed particularly the false economy of making, or reclaiming, certain tools at a cost which, if accurately computed, will exceed the cost of new tools. The attendance at the convention this year was unusually good and the members discussed at length papers on the following five subjects: Repair and maintenance of pneumatic tools; heat treatment of steels; maintenance, issuing and checking of tools in the toolroom; jigs and devices for locomotive and car shops; and tools for the application of radial staybolts. The following officers were elected for the ensuing year: president, Charles E. Helm, Chicago, Milwaukee & St. Paul, Milwaukee, Wis.; First vice-president E. A. Hildebrandt, Cleveland, Cincinnati, Chicago & St. Louis, Indianapolis, Ind.; second vice-president, H. E. Barnes, Southern Pacific, Houston, Tex.; third vice-president, H. P. Jones, Oregon Short Line, Pocatello, Idaho. The association elected as secretary G. G. Macina, Chicago, Milwaukee & St. Paul, Chicago.

Radio Telegraph on the N. C. & St. L.

The Nashville, Chattanooga & St. Louis has on the Huntsville division a wireless telegraph apparatus with which it does business regularly. The sending stations are at Tullahoma, Tenn., and Guntersville, Ala., and routine statistical reports, telegrams, etc., are transmitted between the Tennessee and Coosa Branch and Division headquarters at Tullahoma; and all other communications which were formerly relayed to and from that branch by commercial telephone from Huntsville. There is a gap between Hobbs Island and Guntersville where the road has no wires.

Experiments began with the wireless some four or five years ago at these places and due to some difficulties, such as the location of the station at Tullahoma, on account of high power used in transmitting set, it being almost impossible to insulate satisfactorily, the interference rendered electrical appliances of dentists, banks, including burglar alarms also the time vault which was at one time rendered inoperative, and other occupants of the building in which offices were located at that time, made it necessary to discontinue operation of station until further location was secured; and this, primarily, prompted the erection of the beautiful and modern office building, headquarters of the Huntsville Division, in which the station is now located; and permanent operation was established two years ago.

The huge aerials are suspended from high steel masts, which afford a very attractive appearance causing the station to be visited by hundreds of radio enthusiasts.

The receiving sets used are the popular Zenith and the transmitters are of the non-synchronous spark type, both manufactured by the Chicago Radio Laboratories, of Chicago.

The stations are operated on wave-length of 1621 meters by Dispatchers G. S. Tally and S. B. Gribble at Station WJJ, Tullahoma and E. W. Crabtree at Station WKH, Guntersville.

The economical feature of the wireless, will, no doubt, cause a great expansion of its use in railroad circles. Representatives from various eastern railroads have visited these stations and are making experiments.

The radio programs have been enjoyed by great numbers and especially daytime broadcasting, such as World Series Ball Games, Democratic Convention, etc.

Conference on Toronto Viaduct

Promise of a start in the construction of the $30,000,000 viaduct from the eastern end of the city of Toronto westward along the waterfront to the new Union Station is contained in announcement of a conference held in Toronto last week which was attended by representatives of the Canadian National and the Canadian Pacific, the City of Toronto and the Toronto Harbor Board. At that meeting instructions were given to the solicitors and engineers of the four contracting bodies to commence preparation of the draft agreement which, under the act of the Dominion Parliament providing for the construction of the viaduct, they have four months to prepare. The solicitors and engineers of the four bodies are as follows: Canadian National, W. C. Chisholm, solicitor, and C. B. Brown, engineer; Canadian Pacific, W. H. Curle and J. M. R. Fairbairn; Harbor Board, A. C. McMaster and E. L. Cousins; City, G. R. Geary and R. C. Harris, Works Commissioner. Sir Henry Thornton, president of the Canadian National, and Grant Hall, vice-president of the Canadian Pacific, attended the conference.

Malicious Obstructions

Malicious tampering with tracks and switches, and malicious or mischievious stone-throwing which often results in injury to passengers in moving trains—dangers which are familiar to all railroad officers—have been made the subject of an appeal to the public (or to employees, or to both) printed in the last number of the monthly magazine for employees issued by the New York, New Haven & Hartford.

From the title and character of this magazine, this statement may be taken as an official deliverence of the directors of the railroad. It says:

An extraordinary condition exists in our section of New England. In fourteen months there have been more than 30 cases of obstructions placed upon our rails. Moreover, switch locks are frequently tampered with and cases of stones thrown at passenger trains are numerous. True, but one actual derailment of our trains can be traced to any of these causes, but that in no way lessens our interest in this growing hazard.

Regrettable as the fact is, it is nevertheless a clearly established fact, that an epidemic of youthful vandalism is abroad in our section. Harsh as the word may sound, vandalism is exactly what the condition amounts to when boys, old enough to know better, yet too young to be recognized by the criminal law, engage in train wrecking to satisfy their desire for realism.

Obviously there is something wrong. It may be a lacking factor in education; it may be a failure in developing moral responsibility; it may be a fault in the home itself.

Whatever the reason, it is our duty as citizens of New England to see that fault corrected. The obligation on us is greater than on the average citizen because those of our fellows who use our road trust their lives to our care. We appreciate our responsibility. Modern equipment regularly inspected; up-to-date road-bed carefully signalled and policed; manned by employees of the highest type of loyalty and intelligence, justify us in saying that we are doing all we can as employees to protect the lives of our patrons. Now we must go even farther and extend our protection as citizens to reach into the varied activities that affect youthful development.

This is not altogether a new role for railroad people. We have been preaching safety for years. We have gone into the schools and through them into the homes. Apparently we must go on with what we are doing and then do even more.

We are all members of the civic and social organizations of our respective towns. Many of us have relations with the Boy or Girl Scouts and similar movements. The time has come when through our connections we must interest these several organizations in an effort to put down this growing evil. Everyone, young and old, must have impressed upon them the real effect of violent interference with moving trains. No perverted sense of humor or mistaken idea of what constitutes realism can be allowed longer to go on unchallenged.

It is not fair to blame such actions as those against which we now have to contend on the moving pictures alone. The fault is deeper. The cause is much harder to correct. Education and discipline are the remedies.

We who realize fully what it all means must take the lead in applying the first of these remedies—education—and in stimulating the rest of New England to the intelligent application of both education and discipline.

Operating Results of Canadian Railways for First Six Months of 1924

Operating revenues of all the Canadian railways for the first six months of 1924 were $210,485,546, as compared with $206,590,694 in the same period in 1923; operating expenses were $193,866,868, as compared with $193,359,358; net operating revenues were $16,618,677, as compared with $13,231,335, and operating incomes were $14,361,342, as compared with $12,595,091.

Operating revenues of the Canadian lines of the Canadian National Railways in the first half of 1924 were $97,063,013, as compared with $96,661,948 in the same period in 1923; while operating revenues on the United States lines of that system were $17,799,544, as compared with $19,252,601 in the same period last year; making the total operating revenues for the entire Canadian National system for the first half of 1924 $114,862,558, as compared with $115,914,550 in the same period last year.

Operating expenses on the Canadian lines of the National system in the first half of this year were $97,073,562, as against $99,581,405 in the same period last year; while operating expenses on the United States lines were $15,159,565, as against $14,741,788; making the operating expenses for the entire system $112,233,128, as against $114,323,194.

Net operating revenues of the Canadian lines of the National system in the first half of this year were a deficit of $10,549, as compared with an operating deficit of $2,919,456 in the same period last year; while net operating revenues on C. N. lines in the U. S. were $2,639,979, as compared with $4,510,813, making the total net operating revenues for the entire system $2,629,429, as against $1,591,356.

Operating incomes of the Canadian lines of the National system were $385,582, as compared with an operating deficit of $1,955,569; while on the lines in U. S. they totaled a deficit of $354,624, as against an operating income of $789,111 in the same period last year; making the total operating income for the entire National system $30,957, as compared with an operating deficit of $1,166,457 in the same six months last year.

Operating revenues of the Canadian Pacific were $83,337,822, as compared with $78,605,622 in the same period last year; operating expenses were $73,768,262, as against $70,791,552; net operating revenues were $9,569,559, as against $7,814,070, and operating income was $10,390,084, as compared with $9,566,360.

Best Informed Solicitors Win*

By Lyon Liston

The railroads are just what you make them. There are good ones and bad ones. Ours is the best one, but the entire public does not know it, and it pays the freight. We must convince the public that our road is the best one, or our railroad is one of the others. I have my troubles as well as you. I am a traveling agent, and my whole life is made up of my endeavors to accumulate in my head all the rates, rules and regulations, both traffic and transportation, that are recorded in all the publications issued, not only by our own company, but many issued by connecting lines; for in a great measure my effectiveness depends on the fullness of my information, given offhand on request by any one of a dozen people I am called on to interview in the interest of the company every day.

Shippers are men of all degrees of intelligence. Prejudices must be set aside, friendships formed, and competitors eliminated. Different minds must be influenced by different methods and arguments. Some men do not permit you to talk business to them at all. Some will not under any circumstances promise you anything, while others delight in telling you what they are going to give you. Some have no idea where your railroad actually is located, and some, through their duties calling on them to obtain reductions in rates and classifications, know as much about your railroad as you do, plus the peculiar characteristics of your superior officer. They are wise and the successful solicitor must meet them on their own ground and please them. If you do they will forgive many frailties in your railroad, and continue to favor you, their friend. If, on the other hand, you do not please them they do not hesitate to deduct two or three days from your competitor's time and add it to yours. Some quarrel with you and expect you to come right back at them; others would never forgive you if you differ with them.

The successful solicitor must have a monumental supply of information, not in the files at the office, but in his head, on the tips of his fingers at all times. When a shipper wants to know something he often does not want to wait for you to find it out for him. He makes a friend of the man who knows; the others get what is left. The man who can do all this is a successful solicitor.

Do not think from all this that I am trying to work up any sympathy for the solicitor; far from it. He is the happiest and most care free being in the whole world. All he does is spend his life and the company's money in associating with his friends, visiting them from time to time, taking them out to dinner with him, to shows and what not; he is always smiling, for he is in the midst of his friends, who are in the midst of merriment, and all is jollity and mirth. . . . Let each and everyone forget his troubles, remembering that pay-day comes quickest to those who work hard. As a matter of fact, it does not, but it seems to—Try it and see.

* From the Southern Pacific Bulletin. Mr. Liston is now general agent of the Southern Pacific at Indianapolis, Ind.

The Columbia Bridge

The bridge of the Pennsylvania Railroad crossing the Susquehanna river at Columbia, Pa., 28 miles below Harrisburg, is one of the most interesting historic features on the lines of that company. It is a little more than one mile long, is used by both railroad trains and automobiles and is operated by the block system. The bridge is a part of the Lincoln highway and as many as 3,892 automobiles have crossed it in a period of 24 hours.

From an entertaining historical article on this bridge by W. W. Moore, printed in the Mutual Magazine, the following facts are gathered:

The first bridge across the river at this point was completed in 1814. It consisted of 53 arches resting on stone piers and was 23 ft. above ordinary water level. It was roofed and cost $230,000. This bridge was destroyed by an ice gorge in 1832 and was replaced in 1834 at a cost of $130,000. This second bridge had on its down-stream side two tow-paths, one above the other, for the use of mules which hauled across the river the boats of the Susquehanna Canal.

In the latter part of 1834 rails were laid on the bridge and the railroad from York, Pa., to Wrightsville, at the west end of the bridge, was extended across the bridge to Columbia. Locomotives, however, were not allowed on the bridge and both passenger and freight cars were pulled across by long strings of mules.

In 1863 this bridge was destroyed by fire by Union militia to prevent the eastward progress of the Confederate Army; and, because of war conditions, the next bridge was not built until 1868. This was a through Howe truss. It was boarded at the sides and was roofed over. This bridge had 29 spans, two of these, in the center, being made of iron, so as to reduce the risk in case of fire. The cost of this bridge, including repairs and improvements of piers, was about $400,000. The Pennsylvania Railroad acquired it from the Columbia Bridge Company in 1879.

The track on this bridge was in the center, with sufficient space at the sides for pedestrians; but vehicles could use the bridge only when it was clear of trains. The tow-paths were not replaced. On this bridge locomotives were used and each train passing through was followed by a watchman to guard against fire.

This bridge was destroyed by a hurricane on September 29, 1896, the whole structure, from end to end, except the two iron spans, crashing into the water on the upper side of the piers. Until the spring of 1897 the railroad traffic had to be carried across the river in ferryboats, a considerable portion of the freight, however, being sent around by way of Harrisburg. In the winter when the river was closed by ice, all had to go through Harrisburg.

The present steel bridge was put up in 1897 the work of erection being completed in 21 days. It was opened for railroad traffic on June 7 and for pedestrians and vehicular toll traffic on July 8. The cost of the bridge was $450,000. Like its predecessor, this bridge can accommodate highway vehicles only when clear of trains.

The toll collectors at the ends of the bridge are the block signal operators, and each keeps a supplementary block sheet to record the vehicles admitted to the bridge, using for this purpose the number of the ticket sold to the driver for passage through the bridge. Before admitting a train to the bridge, the collector checks his record, communicating with the collector at the opposite end, and assures himself that all vehicles which have been admitted to the bridge have cleared it. The posted speed limit for automobiles is 20 miles an hour, which allows three minutes for crossing the bridge. Automobiles, therefore, may be admitted until within a

few minutes of the time a train is due. The blocking, both of trains and vehicles, is absolute as regards opposing movements, and trains are not allowed to follow automobiles; but automobiles are allowed to follow a train without waiting for it to reach the far end of the bridge. There are six passenger trains daily in each direction, and several freight trains.

Revenues and Expenses for July

Class I railroads operating 235,725 miles had operating revenues totaling $481,296,200 in July, according to reports for the month compiled by the Bureau of Railway Economics from returns filed by the carriers with the Interstate Commerce Commission. This was a decrease of $54,714,400 or 10.2 per cent as compared with the same month last year. Operating expenses totaled $369,711,000, a decrease of $45,037,000 or 10.9 per cent.

The net operating income was $74,027,600, as compared with $84,866,400 in July last year, or a decrease of $10,838,800. In June, 1924, the net operating income was $65,528,960. The net operating income for the first seven months this year totaled $465,616,601 which was at the annual rate of return of 4.07 per cent on their property investment, as compared with $531,712,590 or 4.83 per cent for the same period last year.

The net operating income by districts for the first seven months with the percentage of return on property investment on an annual basis was as follows:

New England region	$17,932,630	3.58 per cent
Great Lakes region	96,086,515	4.95 per cent
Central Eastern region	99,161,466	4.16 per cent
Pocahontas region	25,686,828	5.30 per cent
Total Eastern district	238,867,439	4.50 per cent
Total Southern district	77,021,619	5.21 per cent
Northwestern region	36,461,435	2.39 per cent
Central Western region	76,173,352	3.59 per cent
Southwestern region	37,092,756	3.73 per cent
Total Western district	149,727,543	3.22 per cent
UNITED STATES	465,616,601	4.07 per cent

Twenty-seven Class I carriers operated at a loss in July, of which 10 were in the Eastern district and 17 in the Western district. In June 38 roads had operating deficits.

While freight traffic showed a decrease of approximately 10 per cent for the first seven months compared with the corresponding period last year, and total operating revenues showed a decrease of 7.8 per cent, operating expenses decreased 7.6 per cent.

There was a reduction of $108,172,000, or more than 8 per cent, in maintenance expenses as compared with the corresponding period last year. For the month of July alone, maintenance expenses amounted to $172,435,400, a decrease of $25,925,000 or 13 per cent under the amount expended for that purpose in July last year. For maintenance of way alone there was a reduction in July this year of $3,447,000 or 4.5 per cent compared with July, 1923, while the reduction in expenditures for maintenance of equipment amounted to $22,478,400 or 18.4 per cent.

Carriers in the Eastern district had a net operating income in July of $37,468,860, as compared with $48,313,100 in July last year. Freight traffic in the Eastern district in July, according to incomplete reports, was nearly 20 per cent under that for the corresponding period last year. Operating revenues of the Eastern carriers totaled $239,248,450, a decrease of 14.4 per cent. Operating expenses totaled $183,151,870, a decrease of 14.1 per cent. Class I carriers in the Eastern district earned during the first seven months this year $238,867,439 of net operating income, as compared with $291,974,000 during the corresponding period last year. Class I roads in the Southern district in July had a net operating income of $8,806,600, as compared with $7,708,460 in July last year. Freight traffic on the Southern roads decreased more than 9 per cent. Operating revenues of the Southern carriers in July totaled $59,711,900, a decrease of 4.9 per cent, while operating expenses totaled $47,330,470, a decrease of 7.6 per cent. The net operating income for the Class I roads in the Southern district for the first seven months this year was $77,021,619, as compared with $77,624,750 during the same period last year.

Carriers in the Western district according to complete reports except from the Arizona Eastern, had a net operating income in July of $27,752,100, as compared with $28,844,800 for the same month last year. Freight traffic in the Western district showed a decrease of approximately 6 per cent. Operating revenues of the Western carriers totaled $182,335,800, a decrease of 5.9 per cent, while operating expenses totaled $139,228,700, a decrease of 7.4 per cent. Class I carriers in the Western district during the first seven months this year had a net operating income of $149,727,543, as compared with $162,113,750 one year ago.

Traffic News

The Chicago, Rock Island & Pacific gives notice that beginning with November 1 its refrigerator cars used on other roads are to be accounted for on a mileage basis.

The Denver & Rio Grande Western handled 20,597 cars during August compared with 20,003 in August last year. This company established a record in peach loading this season, when on September 1, the total number of cars loaded was 160.

The Canadian National has placed an electric (storage battery) passenger car in operation between Fredericton, New Brunswick and Centreville on the Centreville sub-division, a distance of 88 miles.

The Cincinnati Traffic Club will hold its next meeting on Monday evening, September 15, at the Chamber of Commerce dining room. Felix Renick, production engineer will speak on visualization in business.

An advisory committee of representatives of shipping and railroad interests and of Canadian grain companies has been formed at Montreal to expedite the shipment of grain through Montreal and thereby relieve the present congestion and prevent its repetition in the future.

The Ohio Valley Shippers' Regional Advisory Board will hold its regular meeting at Hotel Shawnee, Springfield, Ohio, on Tuesday, September 16. The usual reports will be received and there will be a report from a special committee recommending a new code of by-laws.

The Missouri Pacific has reduced the schedule of its Red Ball freight service between St. Louis, Mo., and New Orleans, La., nine hours southbound and ten hours northbound. Under the new schedule a train leaves Gouldsboro yards, New Orleans, La., at 3:30 a. m. and arrives in Dupo yards, St. Louis, at 11:20 p. m. the next day, thereby giving St. Louis third morning delivery and Chicago fourth morning delivery. Southbound, the train leaves St. Louis at 10:30 p. m. and arrives at New Orleans at 3 a. m. the second morning.

A large party of traveling passenger agents and other passenger department men was entertained on September 1 and 2 at a two-day conference at Denver, Colo., given under the auspices of the Denver Passenger Association, the Denver Tourist Bureau and the Rocky Mountain Parks Transportation Company. Following a luncheon meeting which was given for the purpose of urging greater co-operation on the part of the railroads in developing Colorado's wealth and resources, the guests were entertained in Estes Park and at Denver.

A joint meeting of executives of five committees of the Northwest Regional Advisory Board was held on September 6 in the offices of the Minneapolis Traffic Association at Minneapolis, Minn., for the purpose of collecting reports on the car and transportation situations in Minnesota and neighboring states. The efforts of the Northwest Regional Advisory Board have resulted in a satisfactory car situation. The records on August 15 showed an increase in the number of cars on the lines of practically all northwest granger roads as compared with July 15, while the total of available grain cars in Minnesota and neighboring states is much greater than it was a year ago.

Ninety per cent of the hogs received from within a radius of 50 miles at the Indianapolis stockyards are now delivered by motor truck, according to E. L. Browne, Agricultural Economist of the United States Bureau of Public Roads, who has just completed a study of shipping conditions in the Indianapolis district. The use of motor trucks for delivering livestock from the farms to these stockyards, which are the largest east of Chicago, began in 1912. It is claimed that fewer hogs die in transit by truck than by rail. The trucked-in hogs move mostly by night during warm weather. Many farmers who own radio receiving sets, now catch the market openings and still have plenty of time to truck their stock to the best paying yards before they close.

Commission and Court News

Interstate Commerce Commission

The American Railway Express Company and certain railroads over whose lines it operates have filed a petition with the Interstate Commerce Commission for a reconsideration of the order of May 17 reducing class express rates on merchandise in the West and South.

Court News

Subsidies to Railroad Not Taxable as Income

The federal district court for the Southern District of New York holds that government subsidies to a railroad were contributions to capital, not taxable as income, although one of the lines was to be completed before subsidies were paid. The government had the right to place telegraph and telephone lines on the right of way, and prescribe terms for carriage over the roads.—Cuba R. Co. v. Edwards, 298 Fed. 664.

Time for Suit After Carrier's Disallowance of Claim

The New York Appellate Division holds that under a bill of lading providing that claims must be made to the originating or the delivering carrier, and that suits must be begun within two years and a day after disallowance of the claim, failure to sue within two years and a day after notice of disallowance by the delivering carrier is a bar to recovery against either carrier, though the connecting carrier has not disallowed the claim.—Germini v. Southern Pacific, 204 N. Y. Supp. 603.

Safety Appliance Acts

In an action based on the federal Safety Appliance Acts for injuries to an engineer while engaged in interstate commerce, by operating an engine leaking steam which saturated his clothing, the weather being very cold, this froze, causing a cold, resulting in permanent disability, the Indiana Supreme Court holds that neither assumption of risk nor contributory negligence in running the engine to the end of the division with knowledge that the steam was leaking constituted any defense.—B. & O v. Sliger (Ind.), 141 N. E. 467.

Installation of Connections to Private Sidings

The Ohio Supreme Court holds that the provision of the Transportation Act relating to a connection with a private side track for one tendering interstate traffic does not deprive the Ohio Public Utilities Commission of jurisdiction in matters relating to purely intrastate traffic where interstate or foreign commerce is not affected, and an order of the state commission requiring the installation of a switch and connections to serve coal mines was sustained, there being no evidence that the installation would affect interstate commerce.—Pennsylvania v. Public Utilities Commission (Ohio), 141 N. E. 839.

Connections Between Railroads—Exclusive Jurisdiction of I. C. C.

The Ohio Supreme Court holds that where, while the application of a railroad under the Transportation Act for physical connection with another road, both engaged in interstate and intrastate commerce, is pending before the Interstate Commerce Commission, the road makes application to the state Public Utilities Commission for exactly the same connection, and secures it as far as intrastate commerce is concerned, and thereafter the Interstate Commerce Commission denies the original application on grounds affecting both interstate and intrastate commerce, the jurisdiction of the Interstate Commerce Commission was exclusive, and the order of the state commission was reversed.—Lake Erie, Alliance & Wheeling v. Public Utilities Commission (Ohio), 141 N. E. 847.

Foreign Railway News

China Notes

PEKING.

The pending arbitration between the Chinese government and the British and Chinese Corporation with respect to the interpretation of the loan agreement has been dropped in favor of a compromise agreed to by the parties at issue and lately sustained by the British High Court. In the compromise agreement the government position is sustained on two points: First, that its share of the net profits may be used in liquidating railway loan obligations other than those of the Shanghai-Nanking line, and second, that the government is entitled to interest on advances made for capital improvements, such interest to be reckoned as expense of the year to be met before "net profits" are divided. The corporation secures the advantage of a provision for regular amortization of the loan beginning in 1929, whereas the original agreement made no provision for repayment prior to maturity of the loan in 1954. In addition, the government undertakes to use its share of the net profits to the extent of $250,000 annually, if necessary, in extending the facilities of the line. Current rates of interest are to be allowed on such capital funds, which under present conditions will probably be 8 per cent. In addition to removing a source of irritation between the properties, this settlement makes possible the growth of the Shanghai-Nanking in a manner befitting one of the two lines serving the largest city on the Pacific coast. It also serves to increase confidence in the entire list of Chinese railway bonds.

The first bond issue to gain by the Shanghai-Nanking settlement is the Canton-Kowloon. Although this line is under the usual complete administrative control of British appointees, during the Sun Yat Sen disturbances around Canton it has served almost entirely as a military line with heavy expenses and no revenues. The Shanghai-Nanking profits will meet the loan service on this line.

A general stiffening of prices on Chinese railway bonds on the London market is to be noted. The gains since the first of the year are shown by the following comparison:

Interest rate	Name of line	Price (1924) Jan. 3	July 24
5	Peking-Mukden	71	76
5	Shanghai-Nanking	65	73
5	Canton-Kowloon	57	64
5	Shanghai-Hangchow-Ningpo	73	77
4½	Peking-Hankow (London issue)	65	76
	(Paris issue)	65	75
5	Tientsin-Pukow	66	74
5	Tientsin-Pukow (Supplementary)	61	66
5	Tackow-Chinghua	73	74
5	Hukuang	56	53
5	Lung-Hai	48	54

The Canton-Kowloon, the Hukuang and the Lung-Hai lines are not earning sufficient to meet their interests and loan payments, but so far there have been no defaults upon any of their payments. Peking-Hankow and Tientsin-Pukow loan services have been met out of other government funds in spite of the virtual seizure of their revenues by militarists. On the other lines, not only have revenues been sufficient for loan service, but the funds are in the custody of a foreign accountant and a foreign depository.

During the past thirty days the rainfall has averaged probably a little more than an inch per day. The result has been a series of dyke failures, floods, loss of traffic and serious washouts on the Peking-Hankow and Peking-Suiyuan lines.

The sentiment in favor of the use for railway construction of the funds from the expected remission of Boxer indemnities seems to be growing. The Minister of Education is the only member of the Cabinet who objects. The out-of-office *literati* are quite vocal in opposition urging that building railways with the funds will be equivalent to giving them to the militarists but fail to point out how the educationalists would be able to protect the funds from military seizure. In the meantime practically every week sees the announcement of the founding of a new university, nothing less, the only purpose of which is to get ready to put in a claim for a share of the indemnity, if and when remitted. These actions will go far to support the idea of railway construction which Marshall Wu Pei-fu is pushing so vigorously.

Equipment and Supplies

Locomotives

THE HAVANA CENTRAL is inquiring for 10 locomotive tenders.

THE JODHPUR STATE RAILWAYS OF INDIA has ordered 5 Mikado type locomotives from the Baldwin Locomotive Works.

THE SOROCABANA RAILWAY OF BRAZIL has ordered 9 Mikado type locomotives from the American Locomotive Company.

THE BLODEL DONOVAN LUMBER MILLS has ordered 2 Mallet, 2-6-6-2 type locomotives from the Baldwin Locomotive Works.

THE ILLINOIS CENTRAL, reported in the *Railway Age* of August 23 as inquiring for 25 Mountain type locomotives has ordered 25 heavy Mountain type locomotives from the Lima Locomotive Works.

THE ILLINOIS CENTRAL has placed an order for 10 Mikado type locomotives with the Baldwin Locomotive Works.

THE MISSOURI PACIFIC, reported in the *Railway Age* of September 6 as inquiring for 50 locomotives, has ordered 10 Pacific type and 25 Mikado type locomotives from the American Locomotive Company and 15, 0-8-0 switching type locomotives from the Baldwin Locomotive Works.

Freight Cars

THE GULF COAST LINES are inquiring for 500 box cars, 500 auto box cars and 250 gondola cars.

THE AMERICAN LOCOMOTIVE COMPANY has ordered 1 air dump car from the Magor Car Corporation.

THE GREAT NORTHERN has placed an order for repairs to 300 box cars with the Siems-Stembel Company.

THE BOLIVIAN GOVERNMENT RAILWAYS are inquiring through the car builders for 10 gondola cars, also for 5 box cars.

THE CENTRAL VERMONT has ordered 200 single sheathed box cars of 40 tons' capacity, from the American Car & Foundry Co.

THE TENNESSEE COAL, IRON & RAILROAD COMPANY has ordered 4 additional 30-yd. extension side dump cars, from the Clark Car Company.

THE MARION STEAM SHOVEL COMPANY, Marion, Ohio, has ordered an additional 30-yd. extension side dump car, from the Clark Car Company.

THE GENERAL ELECTRIC COMPANY, Schenectady, N. Y., has ordered from the Clark Car Company 7, 30-yd. extension side dump cars, of 50 tons' capacity.

THE ILLINOIS CENTRAL, reported in the *Railway Age* of August 23 as inquiring for 4,000 gondola cars, 2,000 box cars, and 200 stock cars, has placed orders for 6,200 freight cars.

THE ST. LOUIS SOUTHWESTERN, reported in the *Railway Age* of August 30 as inquiring for 1,000 box cars, has ordered 1,000 box cars of 40 tons' capacity from the American Car & Foundry Co.

THE READING is inquiring for 1,000 hopper cars of 55 tons' capacity. This is in addition to its inquiry for 1,000 box cars and 1,000 gondola cars which were reported in the *Railway Age* of September 6.

THE TEXAS & PACIFIC, reported in the *Railway Age* of August 23 as inquiring for 2,000 auto box cars, has ordered 1,000 auto box cars from the American Car & Foundry Co. and 1,000 single sheathed box cars from the Pullman Car & Manufacturing Corp.

THE LEHIGH & NEW ENGLAND, reported in the *Railway Age* of July 5 is asking for prices on the repairs of 300 hopper cars of 50 tons' capacity, has given a contract to the American Car & Foundry Company for repairs to 300 gondola cars at the Berwick, Pa., plant.

Passenger Cars

THE LEHIGH VALLEY is asking for prices on 2 dining cars.

THE TEXAS & PACIFIC is inquiring for 10 baggage and express cars and 3 mail and baggage cars.

THE BOLIVIAN GOVERNMENT RAILWAYS are inquiring through the car builders for 12 passenger cars.

THE NEW YORK, NEW HAVEN & HARTFORD has ordered 10 gasoline motor cars from the J. G. Brill Company.

THE MISSOURI PACIFIC, reported in the *Railway Age* of August 9 as inquiring for 50 express refrigerator cars, has ordered this equipment from the General American Car Company.

THE NEW YORK RAPID TRANSIT CORPORATION ordered four articulated subway cars of three sections each, from the Pressed Steel Car Company, for subway and elevated line service. The three sections of a car are mounted on 4 trucks. These cars will have vestibules between sections. Each guard will operate two cars comprising 6 sections and the motorman will be in the forward cab. Orders for the electrical equipment and auxiliary apparatus are now being arranged for.

Iron and Steel

THE BOSTON & ALBANY is inquiring for 150 tons of steel for bridges.

THE CHESAPEAKE & OHIO is inquiring for 200 tons of steel for bridges.

THE LEHIGH VALLEY is inquiring for 1,000 tons of steel for bridge work.

THE ERIE has ordered from the Shoemaker Bridge Company, 400 tons of steel, for use at Binghamton, N. Y.

THE HAVANA CENTRAL has ordered from the United States Steel Products Company, 4,000 tons of 80-lb. rail.

THE ILLINOIS CENTRAL has released specifications on 14,000 tons of rails which is a part of the 65,000 tons it is expected to purchase.

THE CENTRAL SOUTH AFRICAN RAILWAYS have ordered from the United States Steel Products Company, 22,000 tons of rail.

THE INTERNATIONAL RAILWAYS OF CENTRAL AMERICA have ordered 20,000 tons of 60-lb. rail from the United States Steel Products Company.

THE NORTHERN PACIFIC has ordered 162 tons of structural steel consisting of two 100-ft. deck plate girders for a bridge over the Powder river in Montana from the American Bridge Company.

Machinery and Tools

THE GULF, MOBILE & NORTHERN has placed an order for a 36-in. by 10-ft. heavy planer.

THE NEW YORK CENTRAL has ordered one 20-ton locomotive crane from the Ohio Locomotive Crane Company.

Signaling

THE FLORIDA EAST COAST has ordered from the General Railway Signal Company four interlockings, of four levers each, for installation at Fort Pierce, Fla., White City, St. Augustine and New Smyrna.

TRACK FOREMEN on the Atlantic Coast Line, having been questioned by the Department of Safety, make reports showing that 21 foremen have gone ten years or more without having to report a personal injury to an employee. The number who have had a similar clear record for one year is 36.

Supply Trade News

A. J. Stott, who has not been active in business for the past few years, is now affiliated with the **Glidden Company,** Cleveland, Ohio.

Hughes & Graul, 1313 Peoples Gas building, Chicago, have been appointed northwestern representatives of the **Davis Brake Beam Company,** Johnstown, Pa.

R. W. Payne has been appointed southern sales agent of the **Verona Tool Works,** Pittsburgh, Pa., with headquarters at 613 Fifteenth street, N. W., Washington, D. C.

The Whiting Corporation has given a general contract to **T. D. Hobson & Son,** Harvey, Ill., for a one-story power house, 75 by 75 ft., at Harvey, Ill., estimated to cost $40,000.

The Standard Stoker Company, Inc., New York, has recently opened a sales office at Richmond, Va., and **W. R. Williams** has been appointed district sales manager in charge of the new office.

The Southwest Sales & Equipment Company, Los Angeles, Cal., has been appointed representative for the **Orton & Steinbrenner Company,** Chicago, to handle the latter's products in southern California, Arizona and New Mexico.

The De Remer Blatchford Company, Railway Exchange buolding, Chicago, has been appointed direct mill representative for the **The Lockhart Iron & Steel Company,** Pittsburgh, Pa., manufacturers of locomotive staybolts and engine bolt iron.

H. L. Woolfenden, district manager of the Allis-Chalmers Manufacturing Company, with headquarters at Denver, Colo., has resigned to take charge of sales promotion of the **Scott Valve Manufacturing Company,** with headquarters at Detroit, Mich.

The Railway Improvement Company, New York, has taken over the manufacture and sale of the Hartman center plates; the Perry, Paragon, Woodman, and Peerless side bearings and other products of the Continental Railway Supply Company, Chicago.

L. P. Mercer, resident sales manager of the **Parkesburg Iron Company,** with headquarters at Chicago, has been appointed Chicago district representative of the **Hall Draft Gear Corporation,** with offices at 343 South Dearborn street, Chicago, and will hold both positions.

August Locomotive Shipments

The Department of Commerce has prepared the following table showing August shipments of railroad locomotives from the principal manufacturing plants, based on reports received from the individual establishments:

Year and month	Locomotives					
	Shipments			Unfilled orders		
1923	Total	Domestic	Foreign	Total	Domestic	Foreign
January	229	217	12	1,788	1,699	89
February	207	196	11	2,220	2,141	79
March	282	269	13	2,316	2,214	102
April	217	201	16	2,204	2,111	93
May	238	228	10	2,150	2,045	105
June	232	221	11	1,958	1,854	104
July	239	211	28	1,738	1,652	86
August	272	259	13	1,497	1,406	91
September	335	313	22	1,178	1,102	76
October	310	295	15	977	915	62
November	299	270	29	691	656	35
December	329	305	24	387	365	22
1924						
January	151	147	4	376	344	32
February	99	92	7	499	466	33
March	132	128	4	534	494	40
April	73	63	10	640	586	54
May	111	93	18	643	589	54
June	145	134	11	531	462	69
July	140	130	10	483	416	67
August	139	121	18	361	306	55

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company is calling for bids for the construction of an addition to the powerhouse at Amarillo, Tex.

ATCHISON, TOPEKA & SANTA FE.—This company contemplates the construction of locomotive and car shops at Prescott, Ariz., to cost approximately $100,000.

ATCHISON, TOPEKA & SANTA FE.—This company is calling for new bids for the construction of a passenger station at Canyon, Tex., reported in the *Railway Age* of August 9.

BALTIMORE & OHIO.—This company has awarded a contract to the Seaboard Construction Company, Philadelphia, covering the erection of superstructures for new bridges at Bessemer, Pa., and Laughlin Junction, Pa. These structures will consist of plate girder spans, ranging in length up to 84 ft. The total quantity of steel involved is approximately 600 tons.

BOSTON & ALBANY.—This company has awarded a contract to the McClintic Marshall Company for the fabrication and delivery of structural steel for a bridge over the Quaboag river at Palmer, Mass.

CANADIAN NATIONAL.—This company has awarded a contract to the Hamilton Construction Company, Moose Jaw, Sask., for the construction of a six-stall addition to the enginehouse at Nutana, Sask.

FORT WAYNE UNION.—This company, which was recently organized at Fort Wayne, Ind., has awarded a contract to P. T. Clifford & Sons, Valparaiso, Ind., for the construction of a belt line at Fort Wayne, to cost approximately $200,000.

LUBBOCK & WESTERN.—This company, of which J. A. Wilson, of Lubbock, Texas, is the promoter, is planning the construction of a line from Lubbock, Texas, to Roswell, New Mex., a distance of approximately 150 miles.

NEW YORK CENTRAL.—This company has awarded a contract to the Austin Company, Chicago, for the construction of a one-story car repair shop, 90 ft. by 130 ft., at Hammond, Ind. The building will cost approximately $45,000.

NEW YORK, CHICAGO & ST. LOUIS.—This company plans the construction of a freight station at Fort Wayne, Ind.

PENNSYLVANIA.—This company has awarded contracts as follows: To Henry Steers, Inc., New York, for the construction of a new float bridge and other waterfront improvements at Greenville, N. J., $500,000; to the Ben Neuendorf Company, Chicago, for masonry for a subway at Ogden avenue, Chicago, $50,000; to the Wilson & English Construction Company, New York, for the construction of a reinforced concrete viaduct to eliminate a grade crossing at Vail, Pa., $40,000; to the Brann & Stuart Company, Philadelphia, for the construction of an overhead bridge to eliminate a grade crossing at Croyden, Pa.

RIO GRANDE CITY.—The Interstate Commerce Commission has issued a certificate authorizing this company to construct a line from Samfordyce to Rio Grande City, Tex., approximately 22 miles, using materials purchased from the federal government, which had planned the construction of such a line during the war to serve the military reservation at Fort Ringgold.

SOUTHERN.—This company is calling for bids for the construction of a 26-stall roundhouse at Asheville, N. C.

UNION PACIFIC.—This company plans the construction of a freight station at Glendale, Calif., to cost approximately $150,000. The building will be 32 ft. by 90 ft. and of tile and stucco construction. A concrete loading platform and auto dock and 43,000 sq. ft. of brick and concrete driveways are included in the plans for the station.

Railway Financial News

ALEXANDRIA & WESTERN.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Alexandria to McFarland, La., 20.65 miles.

BALTIMORE & OHIO.—*Bonds.*—The Interstate Commerce Commission has authorized an issue of $75,000,000 of first mortgage 5 per cent bonds, to be sold at not less than 95½ and the proceeds to be used to retire prior lien bonds.

BROWNWOOD NORTH & SOUTH.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Brownwood Junction to May, Tex., 17.65 miles.

CANADIAN NATIONAL RAILWAYS.—*Bonds Sold.*—There was sold last week an issue of $26,000,000 30-year, 4½ per cent bonds of the Canadian National Railways guaranteed principal and interest by the Dominion of Canada. These bonds were made available to the Canadian market on the same terms as to New York. They were offered at 96 and interest to yield 4.75 per cent. The syndicate included Dillon, Reed & Co., the National City Company, the Guaranty Company of New York, Lee, Higginson & Co., the Bankers Trust Company, White, Weld & Co., Harris, Forbes & Co., New York; the Continental & Commercial Trust & Savings Bank, First Trust & Savings Bank and the Illinois Merchant Trust Company of Chicago. This is the second piece of Canadian National Railway financing this year. Issues of $20,000,000 3-year notes and $9,000,000 of equipment trust certificates were put out early in the summer.

CHICAGO, MEMPHIS & GULF.—*Tentative Valuation.*—The Interstate Commerce Commission has issued a tentative valuation report as of 1915 placing the final value for rate-making purposes at $812,174.

CHICAGO, ROCK ISLAND & PACIFIC.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to guarantee an issue of $3,760,000 of 5 per cent equipment trust certificates to be sold at 98 to Freeman & Co.

DELAWARE, LACKAWANNA & WESTERN.—*No Merger Contemplated.*—President William H. Truesdale has denied rumors that the Lackawanna is to become a part of the Van Sweringen system.

DENVER & RIO GRANDE WESTERN.—*Foreclosure Hearing.*—A hearing on the application of non-asserting first mortgage and refunding bondholders of the Denver & Rio Grande Western for permission to intervene in the proceedings looking towards the fixing of an upset price for the railroad which is to be offered for auction as the result of default in the interest payment on mortgage and bond issues was started on September 3 in the United States District Court before Judge J. Foster Symes at Denver, Colo. The hearing is the outgrowth of the filing of a suit in foreclosure as the result of a default by the road of the semi-annual payment of interest on $38,119,000 first mortgage and refunding bonds which has been in default since September 1, 1922.

The court was also asked to pass upon the application of Harold Palmer of New York, representing holders of approximately 10 per cent of the outstanding first mortgage and refunding bonds of the road and of Forrest W. Bennett of Denver, who have asked to be permitted to intervene and be heard in opposition to the proposed sale and reorganization of the road. At the outset of the hearing Judge Symes declared he was not interested in the merits of the proposed reorganization plan whereby control of the road would pass to the Missouri Pacific and the Western Pacific but merely in the fixing of the upset price to be demanded by the court. The petition asked that the court fix the upset price for the auction at $42,883,875 representing the total par value and defaulted accrued interest on the bonds. The purchasers of the road under the reorganization plan are asking the court to fix the upset price at $14,500,000 which is said to represent the present approximate market value of the issue. The Bankers' Trust Company and the New York Trust Company of New York City, the bondholders for Texas committees and the Denver & Rio Grande Western opposed the petition of Harold Palmer of New York, to be permitted to intervene in the foreclosure sale.

On September 4 the right to intervene was denied. The upset price and the date for the auction sale will be fixed shortly by the court.

MAINE CENTRAL.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Hereford Railway, which it operates between the Canadian boundary and Lime Ridge, Que., 52.85 miles, by purchase of its stock, in order to secure on reasonable terms the abrogation of the present lease and relieve itself of responsibility for a large deficit, and also for authority to abandon the line.

MANISTEE & NORTHEASTERN.—*Abandonment.*—The receiver has applied to the Interstate Commerce Commission for authority to abandon the entire line of this company, from Manistee to Traverse City, Mich., 70 miles, together with branches making a total mileage of 183. The application says it is proposed to scrap or otherwise dispose of the property for the benefit of the bondholders, as traffic is wholly insufficient to support the line and no interest in the property will furnish the money required to continue operation.

MISSISSIPPI SOUTHERN.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire and operate under lease 16 miles of the Gulf & Ship Island between Lumberton and Maxie, Miss.

NEW YORK, CHICAGO & ST. LOUIS.—*Stockholders' Protective Committee.*—Godfrey & Marx, New York, have announced that a stockholders' protective committee is being formed by owners of preferred stock of the New York, Chicago & St. Louis and of common and preferred stock of the Chesapeake & Ohio. The purpose of the committee is, if possible, to secure better terms than those offered in the Van Sweringen merger plan. A statement issued by the firm says: "The committee is advised and believes that the New York, Chicago & St. Louis preferred shareholders are entitled to receive under the unification plan $110 per share. As to the Chesapeake & Ohio shareholders the committee believes that they are entitled to much greater consideration than now offered. To secure and enforce their rights the committee is prepared to apply to the Interstate Commerce Commission and the courts."

PARIS-ORLEANS.—*Bond Issue.*—A. Iselin & Co., Brown Brothers & Co., Halsey, Stuart & Co., and Hemphill, Noyes & Co., are offering $10,000,000, 7 per cent external sinking fund gold bonds of the Paris-Orleans Railroad of France. The bonds mature September 1, 1954. The price is 92¾ and interest and the yield over 7.60 per cent. The bonds are in $500 and $1,000 denominations and interest is to be paid semi-annually. Payment of interest and sinking funds is covered by a common fund into which excess receipts of the large French companies are paid and by payments which the French government has undertaken to effect if necessary to make up deficiencies. The Paris-Orleans operates 4,848 miles of line in central and southern France. It operates the direct routes from Paris to Bordeaux, Nantes and St. Nazaire and its lines are part of the through route between Paris and southern France and Spain.

PITTSBURGH & WEST VIRGINIA.—*Segregation of Coal Properties.*—Following a meeting of the board of directors on Monday a statement was issued reading in part as follows:

"At a meeting of the board of directors of the Pittsburgh & West Virginia Railway Company, held this day, it was unanimously decided to dispose of the question of the ownership of the Pittsburg Terminal Coal Company, by segregating this company from the railway company. It is the thought that with the strong cash position of the coal company both time and conditions are proper to consider the consolidation of the Pittsburgh Terminal Coal Company with some other properties in the Pittsburgh district, and with this end in view a committee was appointed to investigate and report back to the board at as early a date as possible.

"It was further decided to call the Pittsburgh & West Virginia Railway Company, entire issue of preferred shares $9,100,000, for redemption, in accordance with the by-laws of the company, and to offer common stockholders the right to purchase pro rata the capital stock of the Pittsburgh Terminal Coal Company now in the railway treasury, amounting to 40,000 shares of preferred stock, par value $100 and 80,000 shares of common stock, par value $100, for the total sum of $4,000,000. This figures that

the holder of 100 shares of railway common may purchase 13 shares of coal company preferred, and 26 shares of coal company common for $1,300. It might furthermore be stated that dividends on the Pittsburgh Terminal Coal Company preferred stock have been paid regularly since date of issue and in addition thereto dividends on the common stock have been paid into the railway treasury from time to time.

"It was also decided to issue subject to the approval of the Interstate Commerce Commission $3,000,000 of 5 per cent. Equipment Trust Certificates. It is expected that Dillon, Read & Co. will be the bankers for the company on the equipment issue."

F. E. Taplin, chairman of the board of the Pittsburgh & West Virginia refused to discuss rumors that the segregation was the first step toward a union of the Pittsburgh & West Virginia and the New York, Chicago & St. Louis.

SOUTHERN RAILWAY IN MISSISSIPPI.—*Valuation.*—The Interstate Commerce Commission has issued a final valuation report on this company's property as of June 30, 1915, in which the final value of the property owned and used for common carrier purposes is found to be $4,470,534, and that of the property used but not owned to be $194,511. The final figure is the same as that report in the tentative valuation, which the company protested, claiming $6,948,549.

TAMPICO & NORTHERN.—*Capital Stock Increased.*—The capital stock has been increased from $100,000 to $500,000. The company, which has its principal offices in San Antonio, Tex., was recently granted a concession by the Mexican Government for the construction of a railroad from a point on the Rio Grande to Tampico. It will apply for a domestic charter to build that part of the proposed line between San Antonio and the crossing point on the Rio Grande. Preliminary surveys have been made and as soon as the route is definitely located and right of way secured construction will be started.

TEXAS PACIFIC-MISSOURI PACIFIC TERMINAL RAILROAD OF NEW ORLEANS.—*Bonds Sold.*—Kuhn-Loeb & Co., New York, are offering $5,000,000 first mortgage 5½ per cent bonds, series A, of this company which was formerly the Trans-Mississippi Terminal Railroad. The bonds will mature September 1, 1964, and are offered at 100 and accrued interest. The Terminal Company is owned jointly by the Texas & Pacific and the Missouri Pacific which guarantee the new issue. The proposed issue is in part to retire $3,653,000 three-year notes of the former Trans-Mississippi Terminal, due November 1, 1924. After the retirement of the notes and the bonds by which they are secured, the new issue will be the only funded debt of the Terminal Railroad.

WINSTON-SALEM TERMINAL COMPANY.—*Securities.*—This company has applied to the Interstate Commerce Commission for authority to issue $3,000 of capital stock and $800,000 of first mortgage 5 per cent bonds to be sold at par to Clark, Dodge & Co., New York.

Dividends Declared

Boston & Providence.—2½ per cent, quarterly, payable October 1 to holders of record September 20.

Cleveland, Cincinnati, Chicago & St. Louis.—Common, 1¼ per cent, quarterly; preferred, 1¼ per cent, quarterly; both payable October 20 to holders of record September 26.

Lehigh Valley.—Common, 87½ cents, quarterly; preferred, $1.25, quarterly; both payable October 1 to holders of record September 13.

New York Central.—1¾ per cent, quarterly, payable November 1 to holders of record September 26.

Old Colony.—$1.75, quarterly, payable October 1 to holders of record September 13.

Pere Marquette.—Common, 1 per cent, quarterly, payable October 1 to holders of record September 15. Prior preferred, 1¼ per cent, quarterly; preferred, 1¼ per cent, quarterly; both payable November 1 to holders of record October 15.

Pittsburgh & Lake Erie.—1½ per cent, semi-annually, payable October 1 to holders of record September 15.

St. Louis, Rocky Mountain & Pacific.—Preferred, 1¼ per cent, quarterly, payable September 30 to holders of record September 15.

Trend of Railway Stock and Bond Prices

	Sept. 9	Last Week	Last Year
Average price of 20 representative railway stocks	70.08	71.41	61.29
Average price of 20 representative railway bonds	88.05	87.85	82.55

Railway Officers

Financial, Legal and Accounting

J. W. Swords has been appointed auditor of the Yosemite Valley, with headquarters at Merced, Cal., succeeding W. A. Rabbett, resigned.

T. D. Gresham, attorney of the Texas & Pacific, with headquarters at Dallas, Tex., has been promoted to general attorney, with the same headquarters.

Operating

T. B. Smith, superintendent of transportation of the Durham & Southern, with headquarters at Durham, N. C., has been appointed superintendent, with the same headquarters and the position of superintendent of transportation has been abolished. **S. H. Reams,** vice-president and general manager, has resigned and the position has been abolished.

Traffic

L. Beindorff has been appointed general agent, passenger department, of the Union Pacific, with headquarters at Omaha, Neb.

M. B. Craig has been appointed general agent, traffic department of the Chicago Great Western, with headquarters at Des Moines, Iowa, succeeding **W. L. Seeley** who has been appointed industrial agent, with headquarters at Chicago.

G. W. Teare, general agent of the Chicago, Rock Island & Pacific, with headquarters at Cleveland, Ohio, has been appointed general agent, freight department, with the same headquarters, a newly created position. **F. A. Haas** has been appointed district passenger agent, with headquarters at Cleveland, also a newly created position.

J. G. Royster, district freight agent of the Mobile & Ohio with headquarters at Detroit, Mich., has been promoted to northwestern freight agent, with headquarters at Chicago. **W. J. Cassery,** commercial agent, with headquarters at Detroit, has been promoted to district freight agent, with the same headquarters, succeeding Mr. Royster. **O. D. Pennaiman** has been appointed commercial agent at Detroit, succeeding Mr. Cassery.

J. S. Cureton, general freight and passenger agent of the Piedmont & Northern, with headquarters at Greenville, S. C., has been promoted to traffic manager of the Piedmont & Northern and the Durham & Southern, with the same headquarters. **C. B. Lucas** has been appointed general freight and passenger agent of the Piedmont & Northern, with headquarters at Greenville, succeeding Mr. Cureton. **D. Lumpkin** has been appointed general freight and passenger agent of the Durham & Southern, with headquarters at Durham, N. C.

Mechanical

G. H. Burton, general foreman in the mechanical engineering department of the Pennsylvania, with headquarters at Pittsburgh, Pa., has been promoted to assistant engineer of motive power, with the same headquarters, succeeding **W. P. Rudd,** who has been appointed general foreman, mechanical department, succeeding Mr. Burton.

Engineering, Maintenance of Way and Signaling

W. S. Johns, Jr., supervisor of the Pittsburgh division of the Pennsylvania, with headquarters at Trafford, Pa., has been promoted to acting division engineer of the Akron division, with headquarters at Akron, Ohio, succeeding **H. J. Shaw,** who has been granted leave of absence on account of ill health.

Purchasing and Stores

B. M. Winegar, assistant general tie agent of the Canadian Pacific, with headquarters at Montreal, Que., has been appointed general tie agent, with the same headquarters, succeeding Thomas Walklate, deceased.

Obituary

J. S. Kellie, general agent of the Louisiana & Arkansas and the Mississippi Central, with headquarters at Detroit, Mich., died in Wyandotte, Mich., on September 1.

C. D. Boyd, formerly general coal and coke agent of the Louisville & Nashville, with headquarters at Louisville, Ky., who resigned in April, 1919, to engage in other business, died on August 29.

Alfred M. Schoyer, manager of through freight traffic of the Pennsylvania, with headquarters at Philadelphia, Pa., whose death at Pittsburgh, Pa., on August 26 was announced recently, was born on November 1, 1859, at Allegheny City, Pa., and entered railway service in 1872 as a messenger for the Pennsylvania lines west of Pittsburgh. He subsequently served as telegraph operator, chief operator, train dispatcher and chief train dispatcher. In 1892 he was appointed superintendent of telegraph of the Lines West of Pittsburgh and in 1895 he was also appointed superintendent of telegraph of the Vandalia. He was appointed superintendent of the Eastern division at Allegheny, Pa., on November 1, 1899, and on January 1, 1902, he was appointed general superintendent of the Northwestern region, Lines West of Pittsburgh at Pittsburgh, Pa. He was appointed general manager of the Vandalia on January 1, 1913, and a year later he was elected resident vice-president of the Pennsylvania, Lines West of Pittsburgh, with headquarters at Chicago. On July 1, 1918, Mr. Schoyer was appointed special assistant to the federal manager of the same lines and on March 1, 1920, he was appointed manager of through freight traffic, the position he was holding at the time of his death.

A. M. Schoyer

T. J. Walters, general coal freight agent of the Baltimore & Ohio, with headquarters at Baltimore, Md., died at his home in that city on August 30. Mr. Walters was born on May 3, 1864, at Glamorganshire, Wales, and entered railway service in 1881 as an agent and telegraph operator on the Pittsburgh, Ft. Wayne & Chicago, now a part of the Pennsylvania. He later served in the freight department of various western roads and entered the service of the Baltimore & Ohio on September 1, 1897, as commercial freight agent at Pittsburgh, Pa. On April 15, 1910, he was appointed division freight agent, with the same headquarters and on October 10, 1916, he became manager of the Continental Line and Central States Despatch (Baltimore & Ohio fast freight lines) at Cincinnati, Ohio. Mr. Walters was appointed general coal freight agent of the Baltimore & Ohio on May 1, 1918, in which capacity he was serving at the time of his death.

C. R. Berry, assistant general freight agent of the Chicago Great Western, with headquarters at St. Joseph, Mo., died in that city on September 4. Mr. Berry was born on February 27, 1864, in Collins county, Texas, and entered railway service in 1879 as a telegraph operator on the Kansas City, St. Joseph & Council Bluffs, now a part of the Chicago, Burlington & Quincy. He was appointed cashier in the local freight office of the Chicago, Rock Island & Pacific at St. Joseph, Mo., in January, 1885, and in September, 1888, was appointed local freight agent at St. Joseph, of the Chicago, St. Paul & Kansas City, now a part of the Chicago Great Western. He was promoted to general southwestern agent in April, 1889, and in May, 1890, was promoted to assistant general freight agent. Mr. Berry was appointed assistant general freight agent of the Pere Marquette, with headquarters at Chicago, in April, 1904, and returned to the Chicago Great Western in December of that year as assistant general freight agent at St. Joseph, Mo. He was appointed assistant to the vice-president on June 1, 1910, but later returned to his former position as assistant general freight agent in which he remained until his death.

George P. Finnigan, one of the pioneer inventors in the field of automatic train control, died at the City Hospital in Binghamton, N. Y., on August 29. Mr. Finnigan had been in ill health about three months and had been living at Greene, N. Y., near Binghamton, in which region he had had business interests for many years. His home was at Wilton-on-James, Va., near Richmond.

Mr. Finnigan may be classed as an amateur signal engineer, his chief interests for many years having been in horse breeding and other features of the live stock industry; but he was the first patentee of a train-stop device which included a permanent magnet on the roadway to function automatically to apply train brakes, and he had therefore become well known throughout the railway signaling world. He made experiments on the Delaware, Lackawanna & Western as far back as 1903; but he first became generally known when his apparatus was tried on the lines of the Interborough Rapid Transit Company in New York City about 1911. The device which was used on the Interborough was described in the *Railway Age Gazette* of June 16, 1911, page 1406, but without giving the inventor's name. Later, he experimented for about a year on the New York division of the Pennsylvania.

Since the more general interest in the subject of automatic train control, following the government's sweeping order calling for the installation of train stops on prominent railroads, Mr. Finnigan's activities have been mainly on the Lackawanna, where he began systematic experiments early in 1922. At the largely attended hearing before the Interstate Commerce Commission in Washington in April of that year he made an extended statement, and announced that the Lackawanna road had joined him in comprehensive experiments intended to provide a suitable train control system for that road. (*Railway Age*, April 22, page 972.)

Up to a short time before his death he had been continuously engaged in this work, and an experimental installation has been in operation now for several months. Mr. Finnigan's son, Earl Finnigan, who until recently has been engaged in other business, succeeds his father in the conduct of the Lackawanna experiments.

Keystone

Fascisti Celebrating Opening of New Railway Line from Rome to Ostia at the Mouth of the Tiber